JUNE
1954

29th Annual MAINTENANCE NUMBER

Target for '54—Lower Maintenance Costs

Articles on Modern Shop Procedures...

From Servicing Injectors...

To Hints For Shop Foremen

Plus Front End And Engine Tuneup Specs...

And Our Annual Buyers' Guide

McGraw-Hill Publishing Co., Inc.
Fifty Cents per Copy

BUS TRANSPORTATION

WHICH IS *THINNER?*

The finest thread of a spider's web...

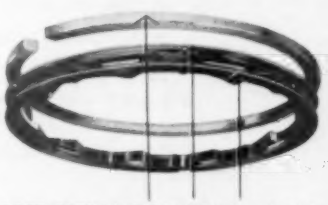
or the oil film that protects a car's engine?

Incredible...but even though the finest thread in a cobweb measures only .00024 of an inch in diameter*, it is still *10 times thicker* than the oil film that lubricates the top of cylinders and pistons.

Old style piston rings, operating where lubrication is poorest, pressure is greatest and heat is highest, wear more than twice as fast as modern chrome rings. That's why engine manufacturers use chrome-plated top rings...and 34 out of the 36 install Perfect Circles.

In Perfect Circle's 2-in-1 Chrome Piston Ring Set, BOTH the top ring AND the oil ring rails are plated with thick, solid chrome, for complete wear protection. This means thousands and thousands of extra miles of sustained power and lasting oil economy for your customers! Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., Toronto, Ontario.

PROTECTION WHERE LUBRICATION IS POOREST



SOLID CHROME PLATING on both top and bottom rings gives complete wear protection throughout entire area of ring travel. Rings are lapped-in at factory, making tedious break-in unnecessary.

**Source of information on request*

Perfect Circle

2 in 1 chrome piston rings

The Standard of Comparison

NEW PROVING GROUND ON WHEELS

records 3 vital braking factors— *continuously • simultaneously • automatically!*

Now we can duplicate any given braking problem—*under actual road test conditions.*

This new testing facility, first in the industry to be completely instrument-equipped, automatically measures and continuously records:

1. Temperatures at all four brake drums.
2. Operating line pressures.
3. Speed and time factors.

Six graphs make synchronized records throughout each test run . . . providing us with brake lining performance pictures never before achieved.

Such information helps us produce brake lining that's safe and dependable under every operating condition . . . with maximum mileage, minimum maintenance *built-in.* Install American Brakeblok next time you reline; it's available from N. A. P. A. jobbers everywhere.

American Brakeblok
REG. U.S. PAT. OFF.

AMERICA'S *SAFETY* BRAKE LINING

Copyright 1954, American Brake Shoe Company

AMERICAN Brake Shoe COMPANY

AMERICAN BRAKEBLOK DIVISION
DETROIT 9, MICHIGAN

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(With which is consolidated Bus Age)

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BUS TRANSPORTATION

JUNE • 1954

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Flxible-Twin Model FT2-40
for Chicago Transit Authority

ANOTHER NEW FLXIBLE ... STEERED BY ROSS

▶ **Pictured is one of 400** Flxible-Twin propane-powered transit coaches being built for Chicago Transit Authority. Seating capacity is 50 passengers, overall length 40 feet. The entire fleet of 400 coaches will be equipped with Ross Steering—*as have all other Flxible coaches since 1936.*

▶ **Exclusive steering specialists** since 1906, Ross provides a gear for every steering need—*manual* or *power.*

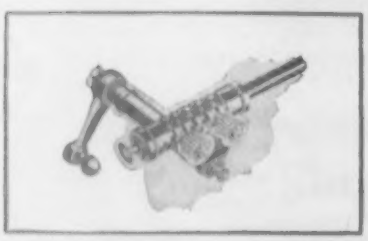
Ross Cam & Lever *manual* steering has long been noted for maximum *ease* and *stability* in just the *right* combination . . . sturdy, rugged construction . . . minimum wear . . . simplicity and speed in any needed adjustment.

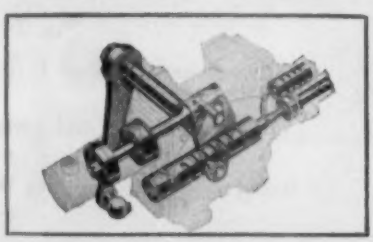
Active in *power* steering since 1942, Ross is currently producing—for a wide variety of vehicles—both *integral* and *linkage* types that are among the *simplest, surest,* most *economical* power units yet developed.

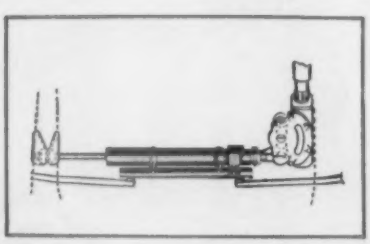
▶ **We invite** discussion of *any* steering problem.

ROSS GEAR AND TOOL COMPANY · LAFAYETTE, INDIANA

Ross STEERING

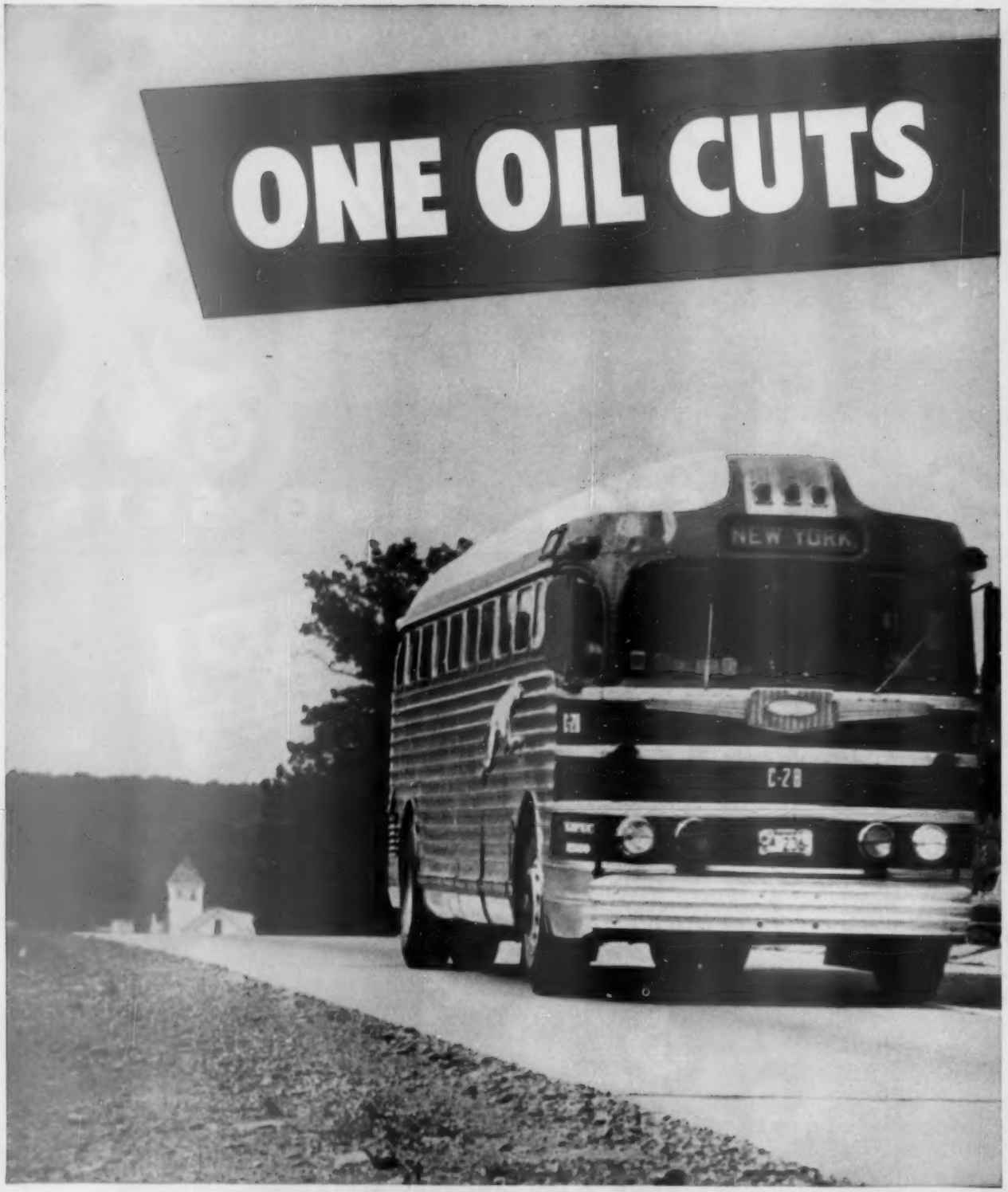


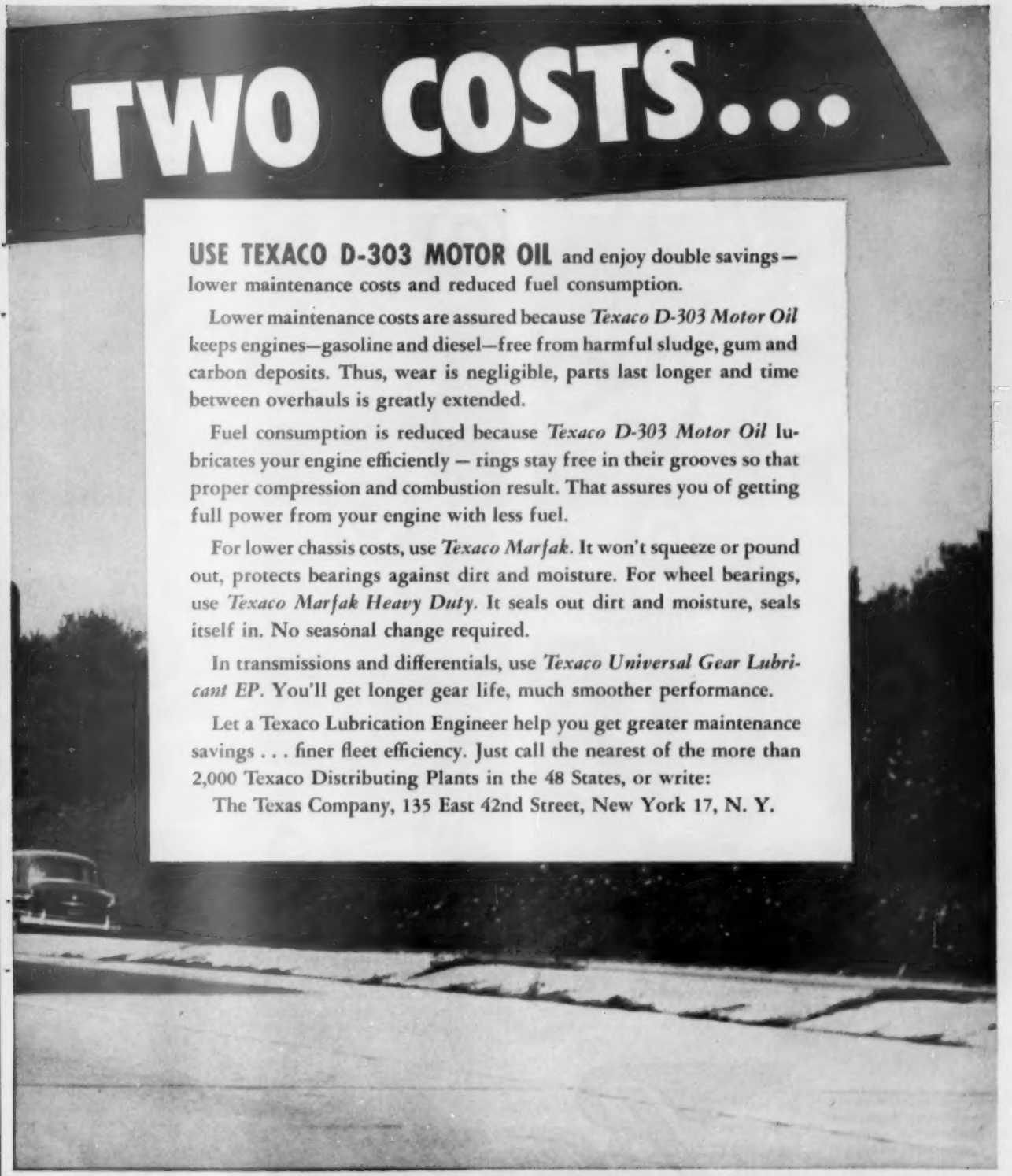




CAM & LEVER MANUAL...HYDRAPOWER INTEGRAL...HYDRAPOWER LINKAGE

Mechanics everywhere applaud
Sealed Power
KromeX
PISTON RING SETS
Read what they say:
"237,465 miles"
"As part of our preventive maintenance program, we recently overhauled a Mack truck in which the Sealed Power KromeX Ring Set had gone 237,465 miles. We are enclosing these rings, which you will see do not show excessive wear. From the foregoing you can see why we appreciate Sealed Power KromeX Piston Ring Sets."
George Hartstein
Maintenance Superintendent
Pittsburgh, Pa.
"Results outstanding"
"I have been using Sealed Power KromeX Ring Sets for the past two years. The results have been outstanding. A new customer recently came in with a 1948 Pontiac which had gone only 3500 miles since reringing with another brand, and had very high oil consumption. I installed a Sealed Power KromeX Ring Set and won a regular customer."
H. S. Kamland
Service & Parts Manager
Louisville, Ga.
"Very high mileage"
"We cannot give any actual mileage record of Sealed Power KromeX Ring Sets we have installed because all of these jobs are still running perfect, even though some of them have very high mileage. Their compression-sealing and oil-controlling ability are the reason I use Sealed Power KromeX Ring Sets exclusively in my shop."
Romie Fields
Auto Repairing
Springfield, Ill.
"Not one complaint"
"KromeX Ring Sets have been used almost exclusively in our repair jobs, and I'm happy to report that we have had not one complaint on any KromeX installation. About 90 days ago we installed a KromeX set in a 1949 Cadillac, and our customer reports that his car is running smoother than ever before and he is very happy."
Clyde Morton
Manager, Automotive Dept.
Tulsa, Okla.
Factory seated for fast break-in!
28 leading engine builders use Sealed Power Chrome Rings
SEALED POWER CORPORATION, MUSKEGON, MICHIGAN
Sealed Power Piston Rings
BEST IN NEW BUSES! BEST IN OLD BUSES!
Sealed Power Motor Parts—The Heart of the Engine · Rings, Pistons, Pins, Sleeves, Valves, Water Pumps


ONE OIL CUTS
NEW YORK
C-28
TEXACO
TEXACO



USE TEXACO D-303 MOTOR OIL and enjoy double savings—lower maintenance costs and reduced fuel consumption.

Lower maintenance costs are assured because *Texaco D-303 Motor Oil* keeps engines—gasoline and diesel—free from harmful sludge, gum and carbon deposits. Thus, wear is negligible, parts last longer and time between overhauls is greatly extended.

Fuel consumption is reduced because *Texaco D-303 Motor Oil* lubricates your engine efficiently — rings stay free in their grooves so that proper compression and combustion result. That assures you of getting full power from your engine with less fuel.

For lower chassis costs, use *Texaco Marfak*. It won't squeeze or pound out, protects bearings against dirt and moisture. For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in. No seasonal change required.

In transmissions and differentials, use *Texaco Universal Gear Lubricant EP*. You'll get longer gear life, much smoother performance.

Let a Texaco Lubrication Engineer help you get greater maintenance savings . . . finer fleet efficiency. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels
FOR THE BUS INDUSTRY

How to reduce brake block cost-per-mile

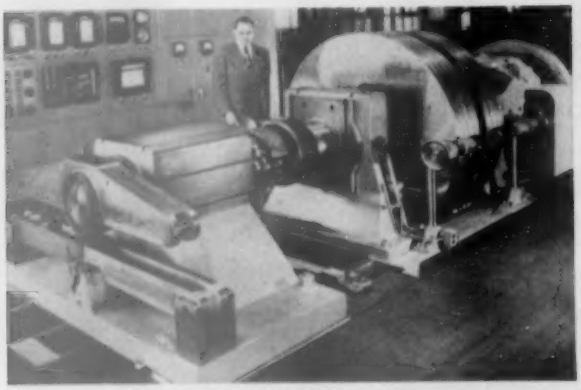
Ask yourself these questions—you may profit from the answers

"Can I really cut downtime due to block failure?"

Yes, Raybestos factory-packaged combinations will give you good deceleration, non-fade action, and more dependable performance day in and day out. By standardizing on them, you can assure yourself more time on the road, faster schedules, and fewer tie-ups.

"Can I get a lot more mileage out of a set of brake blocks?"

Yes. When used in the right combinations, Raybestos Brake Blocks have much longer life than ordinary or inferior blocks. It's a fact that has been proved to the satisfaction of hundreds of fleet operators all over the country. Their records prove it.



"What other benefits can I expect from Raybestos blocks?"

Exhaustive dynamometer and Proving Ground Tests prove that Raybestos blocks will also reduce the labor cost of relines, the labor costs of "too frequent" adjustments, the costs caused by drum damage, and the extra check-up costs due to non-uniform performance.

"Do other Raybestos products provide the same kind of savings?"

Yes, your costs can be still further reduced by using Raybestos Ray-Lok and Ray-Metl Clutch Facings. And if you have light and medium vehicles in your fleet, by using Raybestos PGT Truck Sets or Raybestos Lined Brake Shoes—either riveted or bonded.

To learn more about the savings Raybestos can give you, ask your Jobber Salesman about the unique Raybestos Fleet Engineering Plan

Raybestos®

GET IT FROM YOUR JOBBER

AMERICA'S BIGGEST SELLING BRAKE LINING

RM

RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

RAYBESTOS-MANHATTAN, INC., Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Industrial Rubber, Engineered Plastic, and Sintered Metal Products • Rubber Covered Equipment • Asbestos Textiles • Packings • Abrasive and Diamond Wheels • Bowling Balls

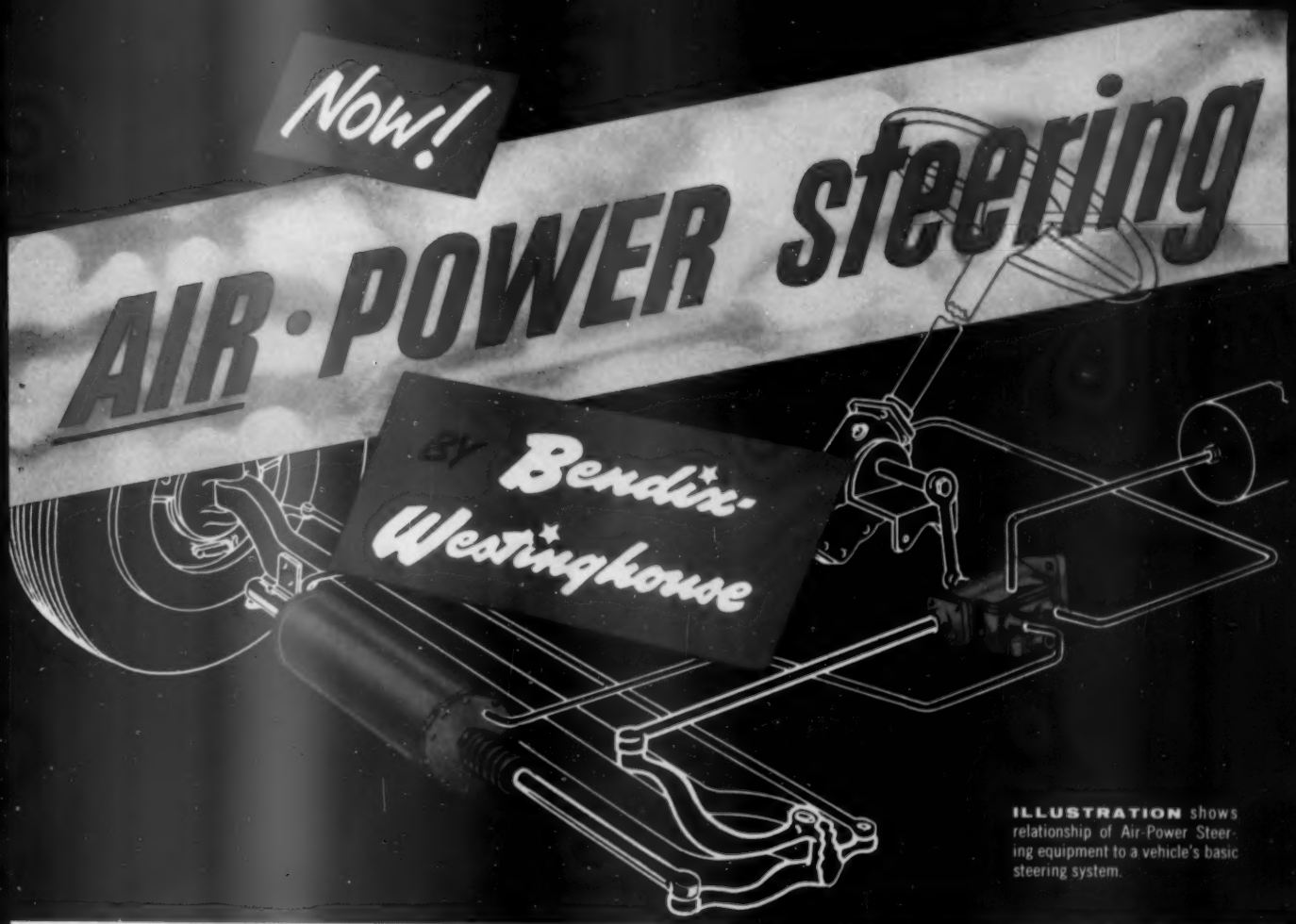


ILLUSTRATION shows relationship of Air-Power Steering equipment to a vehicle's basic steering system.

The only power steering that requires no additional power source!

Now you can make the compressor in your air brake system pay off two ways—not only as a medium for sure, effortless stops, but as the power source for smooth, effortless steering as well! That's because new Bendix-Westinghouse Air-Power Steering uses the basic air brake compressor as its source of power. Thus, you save money by buying and maintaining *one* power system *only*—you step up performance because no matter how much weight you are carrying or how slowly you are rolling, the grueling effort required to handle big equipment is eliminated completely—steering, in fact, becomes so easy that even your biggest buses will handle like toys!

For Bendix-Westinghouse Air-Power Steering takes the drudgery out of driving, lets the driver sit back in comfort and "guide" even the biggest jobs—through city traffic or over the open road, in rain or shine—with complete confidence and without fatigue! Yes, regardless of weight, speed, tire size, road conditions, weather or size of driver, Bendix-Westinghouse Air-Power Steering provides new standards of safety, ease and efficiency of operation on any transit job!

Be sure to *specify* Bendix-Westinghouse Air-Power Steering on your *new* buses—find out the complete story of how you can save time, money and step up performance by writing for complete information today. Address Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio.

CONTROL VALVE is the heart of the system. Operates in response to the force developed between the steering gear pitman arm and the steering knuckle arm. Delivers compressed air to power cylinder only when steering wheel rim pull exceeds 6 to 10 pounds.

THE DOUBLE-ACTING POWER CYLINDER provides adequate, dependable power for steering assist—is designed to offset road shocks under rough operating conditions.

Bendix-Westinghouse

AUTOMOTIVE AIR BRAKE COMPANY

BENDIX-WESTINGHOUSE AIR BRAKES REG. U.S. PAT. OFF.

GENERAL OFFICES AND FACTORY—ELYRIA, OHIO • BRANCHES—BERKELEY, CALIFORNIA AND OKLAHOMA CITY, OKLAHOMA

DELCO PRODUCTS DIVISION
GENERAL MOTORS CORPORATION • DAYTON, OHIO

South Suburban SafeWay Lines

reports

lower operating costs than 20 years ago!

with their big **GM** *Diesels*

PHONES—HARVEY 91
CHICAGO—IN 8-9744

SOUTH SUBURBAN SafeWay Lines, Inc.

RENDERING MODERN BUS SERVICE TO CHICAGO AND ITS GREAT SOUTH SUBURBAN CITIES AND COMMUNITIES

209 East 154th St.
Harvey, Illinois

February 15, 1954

Mr. E. R. Stokel
Sales Representative
Motor Coach Division
General Motors Corporation
Pontiac, Michigan

Dear Ed:

At a recent Regional Meeting of the American Transit Association, I made a statement that startled many of the transit executives who heard it. I said, our costs now, in 1954, were lower than they were back in the 1930's.

Yes, I mean it. South Suburban is operating cheaper today than it was 15 and 20 years ago! Is that possible in the face of higher wage rates, and higher prices of everything we buy?

In the transit business, we produce and offer to the public, not bus miles, but seat miles. What were and are our costs per seat mile?

Back in the old days, before World War II, we operated about 22 bus seats at 20¢ a bus mile, or at .0091¢ per seat mile. Now, with 51-passenger buses, we can operate at a cost of 43¢ a bus mile, or at .0085¢ per seat mile.

How is it possible? Here's how:

1. Bigger buses
2. Better buses, mechanically
3. Standardized Fleet
4. More and better maintenance facilities

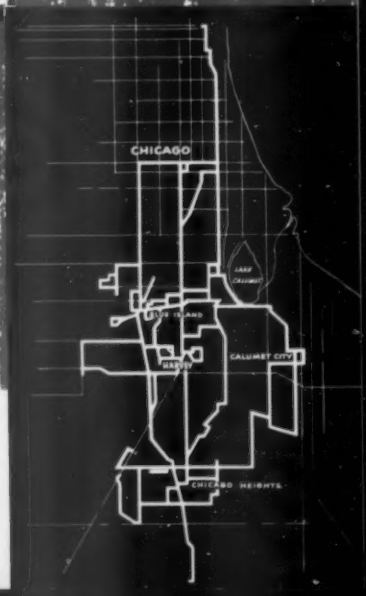
Need I add, our fleet is 100% GMC Diesel!

Sincerely,

Paul O. Dittmar

Paul O. Dittmar
President

POD:me



South Suburban SafeWay Lines operates 175 route miles between the Chicago Loop and outlying suburban areas such as Blue Island, Harvey, Chicago Heights, Calumet City and the new Park Forest.

Bigger Buses . . . Better Buses

Seat mile costs actually lower than 15 and 20 years ago . . . made possible by bigger and better coaches . . . here's dramatic proof how large capacity GM Diesels help operators beat the high cost of doing business today.

South Suburban Safeway Lines, birthplace of Transit Pars, was one of the earliest users of GM Diesel coaches, purchasing three Model 740's in 1939. Regular annual purchases since that time have expanded the Diesel fleet to 93 GM units today.

Profits Increase

Preferring "investment dollars" to "expense dollars," the company has never permitted obsolete equipment to become a drain on earnings, but has kept putting its money in the most efficient transportation "tools" available to increase the system's output per man-hour.

Reflecting the economies of newer, bigger GM coaches have been consistent profits, – improving at a time when profits in the industry have been hard to come by . . . the 1953 operating profit, for instance, was up 17.2% over 1952, – with less than 1% increase in revenues!

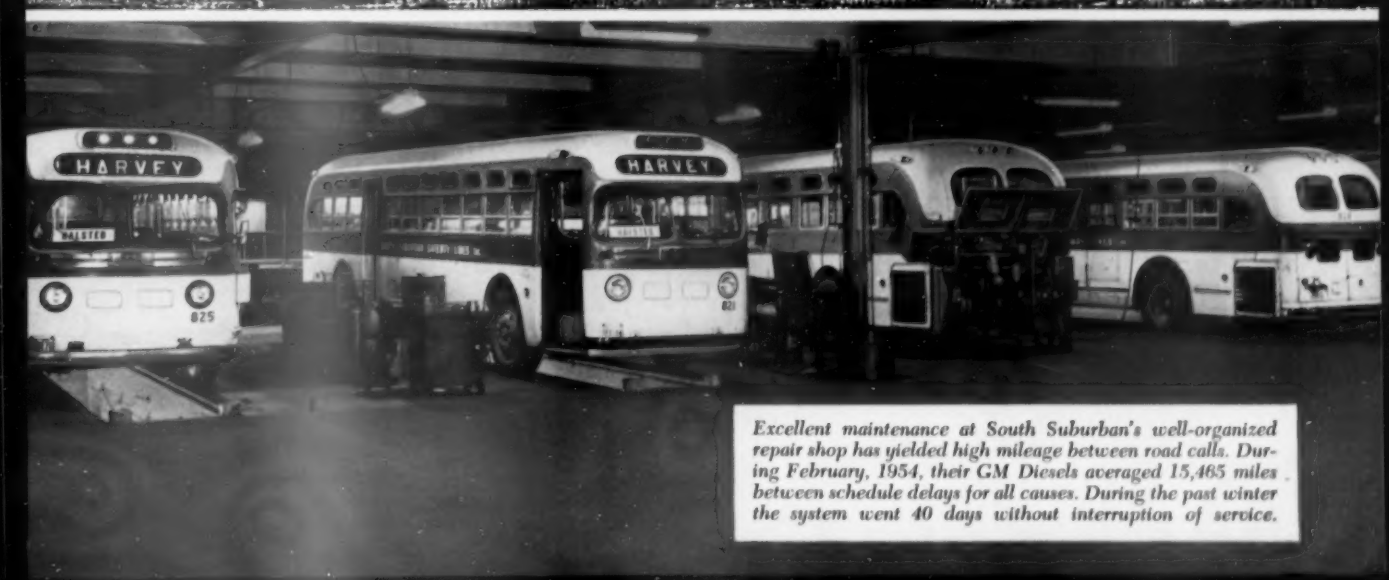
On 2 Lines, 14 Trippers Eliminated

Liquidation of smaller capacity, over-age equipment, of course, has been the answer. Upgrading to bigger GM Diesels (51's replacing 40's and 45's) eliminated 14 trippers on two lines last year. Savings in labor and material exceeded $82,000, compared to 1952, although mileage was down only slightly, reflecting the reduction in units.

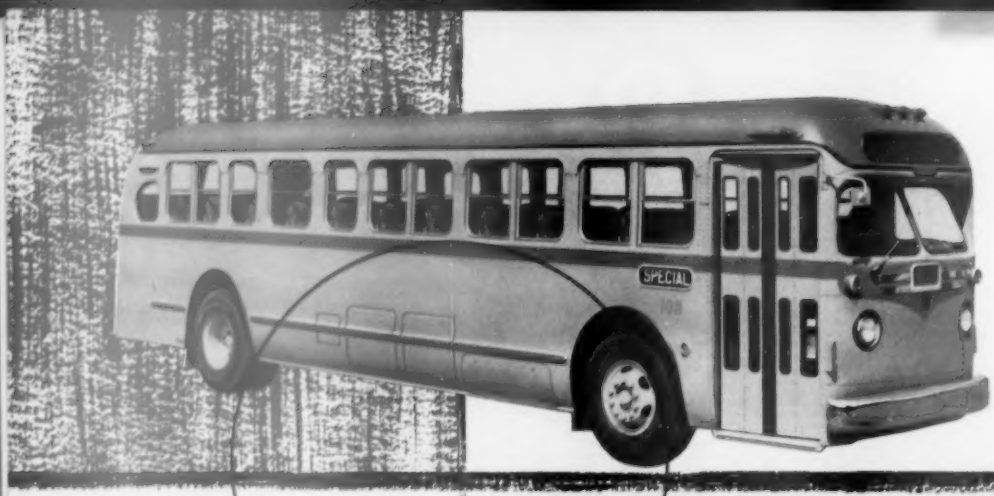
A Birdie for the Equipment Department

Transit Par for cost of goods and services, set at 18% by the American Transit Association, was beaten on this property with a 17.4% record in 1953.

Further improvement in cost-revenue ratios is expected with fleet standardization, effected at South Suburban with the recent delivery of 15 more GM units.



Excellent maintenance at South Suburban's well-organized repair shop has yielded high mileage between road calls. During February, 1954, their GM Diesels averaged 15,465 miles between schedule delays for all causes. During the past winter the system went 40 days without interruption of service.



new

underfloor baggage compartment provides 56 cubic feet of space

TO MEET the need for increased baggage capacity in suburban service, GM's TDM-4515 model is now available with a roomy underfloor compartment.*

This development greatly improves the usefulness of this model for airport service and charter work, and will bring in extra revenue by providing capacity for mail and other light material shipments.

85½" x 56" x 24½" high, it is without partitions and is located in 2 bays immediately behind the spare tire compartment. It extends the full width of the coach, and is easily accessible through 4 doors, – 2 on each side, bringing all cargo within comfortable reach of the driver.

The doors, which unlock with a removable crank and open the full height of the compartment, are suspended on patented rubber hinges, which together with rubber seals around the sides and bottom, completely insulate the compartment against water, slush and dirt.

Illumination is provided by 4 lights which go on automatically when doors are opened.

**Optional at extra cost.*

GM COACH

. . GMC TRUCK & COACH DIVISION, GENERAL MOTORS CORPORATION

PRINTED IN U.S.A.

SASH FOR EVERY TYPE OF TRANSPORTATION – ON LAND, ON THE SEAS, IN THE AIR

TWO GENERATIONS OF GMC BUSSES . . .

EDWARDS SASH-EQUIPPED!

Early Fifth Avenue bus. Model Z-67 Passenger.

1923 . . . Belle of Fifth Avenue

51 Passenger GM Transit Coach. Air Suspension . . . Diesel Power . . . equipped with Edwards Sash for maximum visibility.

1954 . . . Sleek Transit Queen

Even 31 years ago — when the Belle of Fifth Avenue was built (and sleek diesels were still only a gleam in GMC's eye)—leading bus builders were standardizing on Edwards Sash . . . profit-minded operators were specifying it!

For 1954 . . . whether your service is city, interurban, suburban or cross-country, there's an Edwards Sash that meets exactly—and economically—every operating and service requirement. Maximum visibility . . . lower maintenance . . . long-life dependability — these are among the outstanding reasons why so many leaders in the transportation industry use Edwards Sash. Write for complete information.

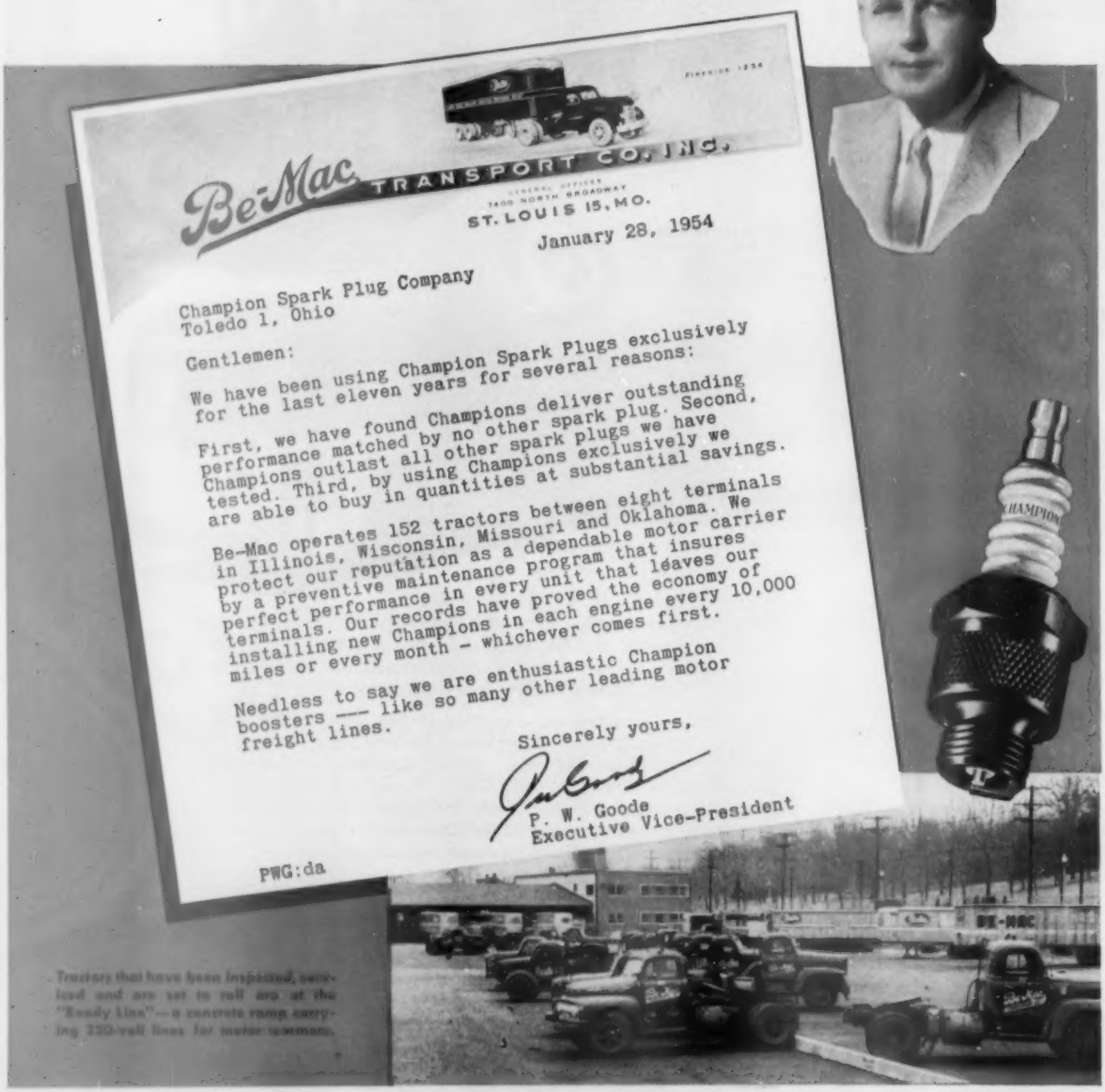
THE O. M. EDWARDS CO., INC., SYRACUSE 4, N.Y.
New York Office—50 Church St., N.Y. 7, N.Y.
In Canada: **O. M. EDWARDS CO. OF CANADA LIMITED**
Offices and Plant
335 Laurentian Boulevard,
St. Laurent, Montreal 9, P.Q.

The 250-foot long maintenance building at Be-Mac has radiant heated floors and a high bay area for servicing trailers.

Aerial view of Be-Mac general offices, terminal, ready line, service station and preventive maintenance building.

"CHAMPIONS outlast all other spark plugs we have tested"

Says—Mr. P. W. Goode
Executive Vice-President
BE-MAC TRANSPORT CO., INC.



Be-Mac TRANSPORT CO., INC.
GENERAL OFFICES
7400 NORTH BROADWAY
ST. LOUIS 15, MO.

January 28, 1954

Champion Spark Plug Company
Toledo 1, Ohio

Gentlemen:

We have been using Champion Spark Plugs exclusively for the last eleven years for several reasons:

First, we have found Champions deliver outstanding performance matched by no other spark plug. Second, Champions outlast all other spark plugs we have tested. Third, by using Champions exclusively we are able to buy in quantities at substantial savings.

Be-Mac operates 152 tractors between eight terminals in Illinois, Wisconsin, Missouri and Oklahoma. We protect our reputation as a dependable motor carrier by a preventive maintenance program that insures perfect performance in every unit that leaves our terminals. Our records have proved the economy of installing new Champions in each engine every 10,000 miles or every month – whichever comes first.

Needless to say we are enthusiastic Champion boosters — like so many other leading motor freight lines.

Sincerely yours,

P. W. Goode
Executive Vice-President

PWG:da

Tractors that have been inspected, serviced and are set to roll are at the "Ready Line"—a concrete ramp carrying 220-volt lines for motor warmers.

BLUE BIRD *advanced engineering presents the* TRAVELER

FOR CITY AND INTERCITY SERVICE

POWERED BY YOUR CHOICE OF WORLD FAMOUS

Ford

or HERCULES ENGINES

•

BLUE BIRD

BEST BECAUSE

- **Up front motor gives unexcelled cooling and ease of maintenance.**
- **Short turning radius for easier traffic handling.**
- **Standard parts available at your local auto dealer.**
- **Body and chassis built by BLUE BIRD for top quality control.**
- **Available in 31, 35, and 39 passenger models.**

•

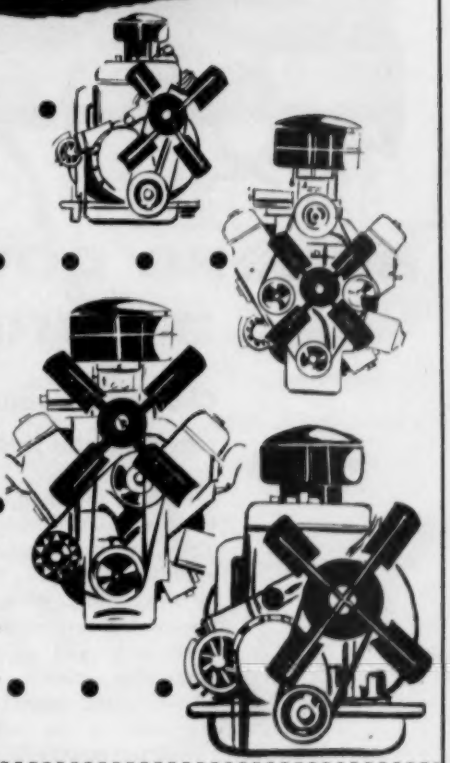
BLUE BIRD BODY COMPANY
FORT VALLEY, GEORGIA

FORD—6 cylinder
Bore ..... 3.50 in.
Stroke ..... 4.40 in.
Displacement ..... 254 cu. in.
Max. BHP at 3500 RPM 112
Net BHP at 3200 RPM 101
Max. torque at 1400 RPM ..... 217 ft. lb.
Net torque at 1200-1600 RPM. 212 ft. lb.

FORD—8 cylinder
Bore ..... 3.62 in.
Stroke ..... 3.10 in.
Displacement ..... 256 cu. in.
Max. BHP at 3900 RPM 138
Net BHP at 3600 RPM 120
Max. torque at 1900 RPM ..... 226 ft. lb.
Net torque at 1500 RPM ..... 218 ft. lb.

FORD—8 cylinder
Bore ..... 3.80 in.
Stroke ..... 3.50 in.
Displacement ..... 317 cu. in.
Max. BHP at 3600 RPM 170
Net BHP at 3600 RPM 151
Max. torque at 1700-2300 RPM. 286 ft. lb.
Net torque at 1400 RPM ..... 276 ft. lb.

HERCULES JXD—6 cylinder
Bore ..... 4.00 in.
Stroke ..... 4.25 in.
Displacement ..... 320 cu. in.
Max. BHP at 3200 RPM 112
Max. torque at 1600 RPM ..... 267 ft. lb.



MAIL COUPON TODAY

Blue Bird Body Co.
Fort Valley, Georgia
Gentlemen:
I am interested in information on the following:
____31 Pass., ____35 Pass., ____39 Pass. Blue Bird Traveler, for use in
____City Service, ____Suburban Service.

Name _____

Address _____

City _____ State _____

BOGGED DOWN BY BREAKDOWNS?

Chances are your Socony-Vacuum Representative can help you find the cause — and prescribe the cure!

A daily line-up of cripples in your maintenance department can be a real headache. They can make your profit column look mighty sick, too. So, if you're bogged down by breakdowns, you need a *specialist* — your Socony-Vacuum representative.

He is backed by Socony-Vacuum's 88 years of experience . . . its vast research facilities . . . the largest staff of lubrication engineers in the industry . . . a complete line of top-quality oils and greases.

Using this background, he'll help you find the cause of your trouble — prescribe the cure. He'll make an analysis of your entire fleet . . . set up lubrication schedules . . . recommend the right lubricants for every unit . . . advise on correct application. And when necessary, he will provide the services of skilled engineers.

* * *

To keep your fleet healthy and *on the road*, call your Socony-Vacuum representative.

CORRECT LUBRICATION FOR FLEET OPERATORS

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL CO., INC.
MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

HAVING BRAKE PROBLEMS?

Sure - Brake **AUTOMATIC** Slack Brake Adjuster can help you. As records will show, drivers *do* complain more about brakes.

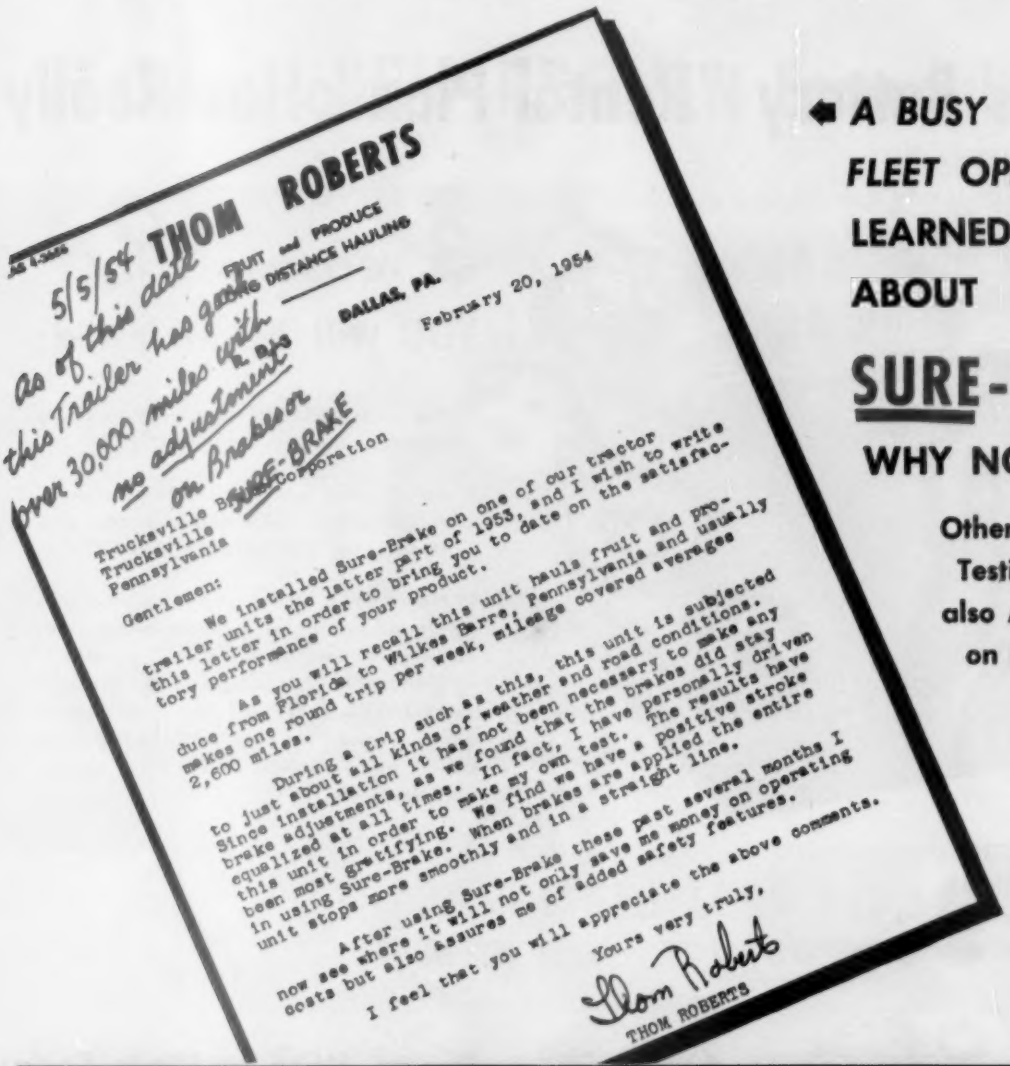
Sure-Brake (Air or Vacuum) *is now prepared* to provide an important step in making your Brake maintenance *less costly* and *more efficient*. For 6½ years, we have been perfecting Sure-Brake through continuous testing.

For 2½ years *road tests* have been conducted by well known fleets, under severe operating conditions.

We are now ready to sell, service and guarantee its performance. You are invited to try Sure-Brake on your *toughest* installations. One *test* installation of your own, will prove our statements.

Sure-Brake is not to be mistaken for any other product of its kind that has has ever been on the market. Its performance is guaranteed *under normal operating conditions.*

We invite you to WRITE—WIRE—PHONE for additional information NOW!



5/5/54 THOM ROBERTS
As of this date FRUIT and PRODUCE
this Trailer has gone LONG DISTANCE HAULING
over 30,000 miles with
no adjustments
on Brakes or

DALLAS, PA.
February 20, 1954

Trucksville Brake Corporation
Trucksville
Pennsylvania

Gentlemen:

We installed Sure-Brake on one of our tractor trailer units the latter part of 1953, and I wish to write this letter in order to bring you to date on the satisfactory performance of your product.

As you will recall this unit hauls fruit and produce from Florida to Wilkes Barre, Pennsylvania and usually makes one round trip per week, mileage covered averages 2,600 miles.

During a trip such as this, this unit is subjected to just about all kinds of weather and road conditions. Since installation it has not been necessary to make any brake adjustments, as we found that the brakes did stay equalized at all times. In fact, I have personally driven this unit in order to make my own test. The results have been most gratifying. We find we have a positive stroke in using Sure-Brake. When brakes are applied the entire unit stops more smoothly and in a straight line.

After using Sure-Brake these past several months I now see where it will not only save me money on operating costs but also assures me of added safety features.

I feel that you will appreciate the above comments.

Yours very truly,

Thom Roberts

THOM ROBERTS

◀ A BUSY FLEET OPERATOR LEARNED THIS ABOUT SURE-BRAKE

WHY NOT YOU?

Other Bonified Testimonials also Available on Request

TRUCKSVILLE BRAKE CORPORATION

TRUCKSVILLE PENNSYLVANIA

Some territories are still open to manufacturers' agents and distributors. If interested write us.

NOW! for lower

YOU CAN *Lease*

Bowers Battery "Rental Plan" Has Really

3 *reasons why* YOU *will be interested:*

1. Plan has PROVEN profitable to every company that has adopted it.
2. Incorporates use of BOWERS Batteries, recognized for more than a quarter of a century for DEPENDABLE OPERATION.
3. In March 1954 survey of bus operators, to determine brands of batteries being used, Bowers maintained FIRST PLACE position—43% of the 903 bus companies interviewed USE BOWERS BATTERIES. The second place battery is used by only 9.4% of the companies and is trailed by 73 other battery manufacturers.

BOWERS BETTER-BUILT BATTERIES
make this rental plan workable and economical!

CUT COSTS AT ONCE . . . Phone, Wire or Write Today

BOWERS BATTERY "RENTAL PLAN"

bus operating costs . . .

BATTERIES *just as you do TIRES!*

"Taken Hold"—PROVEN Economical

√ ***NO INITIAL INVESTMENT***—That's right! You can put this popular, trouble-free, economical and dependable Rental Plan into operation immediately without any outlay of cash!

√ ***YOU PAY-BY-THE-MONTH***—Bowers provides you with easy-to-keep Monthly Reports which show the number of batteries in use. You pay a low-cost rental charge on that number—making small monthly payments instead of large outlays for equipment.

√ ***GUARANTEE IS BASED ON YOUR OWN PERFORMANCE RECORD.*** *You tell us* the "average" number of months' service you've been getting from any brand batteries you've been using. We take your word for it and base our battery-life guarantee and rental fee on your information.

√ ***BOWERS PLAN STARTS WITH YOUR PRESENT BATTERIES—NO NEED TO REPLACE THEM.*** We won't come in and ask you to replace your present batteries with Bowers Batteries right from the start. Keep using your present batteries until they need replacement with Bowers. Get new batteries at any time without any cash outlay for battery purchases.

IT'S A PROVEN FACT **"IT COSTS LESS TO LEASE" WHEN YOUR FLEET IS POWERED-BY-BOWERS**

. . . A Bowers Sales Engineer Will Call Without Obligation.

— Conceived, Developed and Successfully Operated by Bowers.

BOWERS BATTERY & SPARK PLUG CO., READING, PA.

Here's what experts say about

SAN ANTONIO TRANSIT CO., K. M. KENDALL, SUPT. OF EQUIPMENT. "As 12-time winners of the Bus Maintenance ME award, we are particularly conscious of vehicle appearance. For this reason we use Rub-Bub flooring which lasts longer and remains more attractive.".

ST. LOUIS PUBLIC SERVICE, W. E. WILLIAMSON, GENL. SUPT. OF AUTOMOTIVE EQUIPMENT. "We are as proud of our outstanding safety record as we are of our low-cost maintenance. That's why we use Rub-Bub flooring and safety step plate."

Choice of flooring—either for original equipment or for maintenance—is no trivial decision. There's more to it than price alone. There's the safety of your passengers, wear life of the flooring itself and ease of installation. Flimsy floor covering soon wears thin, becomes spotty and unsafe.

So remember this. If, during the life of the vehicle, you have to replace inferior flooring *just one more time* than you would with Rub-Bub, cost of labor alone—not counting cost of the flooring itself—comes to more than the original price differential.

So follow the lead of the leaders. Specify Rub-Bub Flooring for new and reconditioned vehicles. You'll get longer flooring life, greater passenger safety. That's why—for the last 6 years—*over 70% of all urban transit vehicles made have been equipped with Rub-Bub Flooring.* A-8230

RUB-BUB®
Transportation Products

SAMUEL MOORE & CO. MANTUA, OHIO

IN CANADA | SAMUEL MOORE & CO. OF CANADA, LTD.
Represented in Canada exclusively by
RAILWAY & POWER ENG. CORP.

BUS TRANSPORTATION

TOP TOPICS

HIGHLIGHTS OF LAST MINUTE DEVELOPMENTS IN THE BUS INDUSTRY AS WE GO TO PRESS

June, 1954

THERE'LL BE A BIG ROAD-BUILDING PROGRAM starting in July, 1955, under the federal-aid highway law.

Federal funds to the tune of $1.9 billion will be spent on building and improving the highway system, with $700 million of it to be paid to the states in matching funds.

Nobody claims it will solve the highway problem...but it's the most that's ever been allotted for roads...indicates that Administration leaders are thinking in the right direction.

That trend had better keep up, because...

THE INCREASE OF VEHICLE REGISTRATIONS IN 1953 MORE THAN DOUBLED the increase in 1952...that's what the Bureau of Public Roads says.

Registrations increased by more than 3 million...bringing the total up to a whopping 56,279,864. In 1952 the increase was less than a million and a half.

Road usage, of course, is keeping pace with increased registration. Last year 540 billion vehicle miles were run up... a gain of 5.5 per cent over 1952.

LICENSED GUIDES WON'T BE REQUIRED FOR CHARTER TOURS in Washington, D.C., as we reported in last month's issue.

When the District Board of Commissioners announced their intention of enforcing the old law requiring guides, NAMBO and other interested groups swung into action...protested it on various grounds, including original intent of the law and difficulty of enforcement.

The result: The Board put off enforcement until next November...directed a study of the situation by the District Counsel.

Indications now are that the law will die quietly of old age...or will be changed so that it applies only to individual local guides.

NEW YORK CITY OMNIBUS COMPROMISED WITH THE CITY in its fight against the city's plan to make one-way streets out of Seventh and Eighth avenues.

The bus company agreed to the change, which can cost it up to $800,000 a year in lost revenue. In return, the city agreed to extend the temporary 13-cent fare through 1955...

and reduced the gross receipts tax from 11 per cent to five.

The new arrangement will compensate for part of the revenue loss, Omnibus officials say.

FIRST QUARTER PROFITS FOR GREYHOUND TOOK A BIG DIP...but President Orville S. Caesar attributes it to the general decline in travel which began in the last month of 1953...and slammed every form of public transportation.

'Hound's consolidated net income after all charges and taxes was $350,663, or three cents a share on common stock. Comparable figures for the first quarter of last year were $1,458,121 and 13 cents a share.

The future? Caesar feels the slump is due to general economic conditions...will be overcome as the year passes.

THEY'VE TAKEN OFF THE GLOVES IN WISCONSIN, where a governor's committee is studying ways and means to help the transit industry.

Bus men appearing as witnesses demanded the right to increase fares without prior PSC approval. City officials got in the act too. Some charged that companies wouldn't co-operate by running lines to outlying districts...others went as far as to suggest that city parking meter revenues be used to help bus companies, as transit and parking are all part of the same problem.

The question now is whether the committee will make itself felt...or die quietly in labor.

If it's the former, keep your eye on Wisconsin. And watch for the complete up-to-date story in next month's BT.

THERE'S GOOD NEWS FROM MARMON-HERRINGTON...its backlog of orders for buses, trolley coaches and heavy duty trucks is large enough to keep the plant running at its current rate for the remainder of the year.

An order from Philadelphia Transportation Co. for 46 trolley coaches -- worth over $1 million -- didn't hurt the outlook a bit.

Earnings in the first quarter were 29 cents a share... two cents better than the same period last year. And Col. A. W. Herrington, president, expects the upward trend to continue as more and more transit firms hit the market for new vehicles.

INTERCITY MEN IN NEW YORK STATE AREN'T HAPPY with the Thruway Authority and its rate of 3.5 cents a mile for buses using the

soon-to-be opened super road.

The State Inter-City Bus Traffic Association has already registered a protest...will put it in writing at the request of Thruway officials.

Their chief gripe: while the rate is no higher than on the Jersey or Pennsylvania turnpikes, in those states carriers are allowed to credit gross receipts and gas taxes against the turnpike charges. Carriers also protested the proposed speed limit of 50 mph for buses, while private cars can zip along at 60.

ICC COMMISSIONER OWEN CLARKE IS NEW DEFENSE TRANSPORT ADMINISTRATOR, succeeding Cmsr. James Knudson, who resigned to enter private law practice.

Clarke hails from the state of Washington...was named to ICC last year for a term which expires December 31, 1959.

Unless something unexpected happens, Clarke won't have much time to settle in his new post...the Defense Transport Administration is expected to suspend operations on June 30, 1955.

THERE'S TALK OF USING PROPANE AT SEATTLE, where the Transit Commission has been discussing the experimental use of propane-operated buses to compare results with gas and diesel vehicles.

The Commission now has 15 buses on order--some gasoline, some diesel. But General Manager Lloyd Graber has advised that manufacturers can provide propane equipment if notified in time.

One reason for the sudden interest is that two big refineries in the Seattle area, now under construction, will produce propane as a by-product.

TOP LEVEL CHANGES are taking place in the Greyhound family. A. N. (Red) Brion, president of Northland Greyhound, has been appointed vice president in charge of sales for Greyhound Corp. He will take over the duties of J. L. Williams when Williams retires next September.

Albert O. Olson, vice president, will step up to the president's chair of Northland. Howard W. Walter, comptroller, has been named vice president-comptroller.

ANOTHER TOP MANAGEMENT CHANGE involves the Yonkers Railroad Co., N. Y., where Sam Schreiber has been named president. He had been serving the company as consulting engineer.

Let's Hit That Bullseye

ONE OF OUR PRIME TARGETS to shoot for in 1954, as set forth on the opposite page, is lower maintenance costs.

Let's hit that bullseye smack on the nose.

Never before in the history of the public transportation industry has it been so necessary to hold down costs . . . to get more miles out of each dollar spent for maintenance.

Despite the substantial savings that have been made, maintenance still offers a fertile field for further economies as attested by the various articles in this issue.

Prudent operators still are finding ways to improve maintenance efficiency and thus stretch the maintenance dollar. Worthwhile economies are being procured through the elimination of unnecessary operations, the streamlining of job sequences and the use of power tools to implement or supplant manual operations.

In these and many other ways, economy-minded maintenance men are adding a couple of extra miles to the life of a part, a fraction of a mile to a gallon of fuel or the reduction of a minute here and there from the time required to perform some particular job.

All of this is translated into lower maintenance costs, which in turn means more miles from each maintenance dollar.

THE EDITORS

LOWER Maintenance Costs

That's the theme of the 29th Annual Maintenance Issue of BUS TRANSPORTATION, an issue packed with articles and photo-story reports, each specifically designed to point the way to cost-cutting maintenance methods.

A half billion dollars will be spent on maintenance this year by transit and intercity carriers. A mere one per cent reduction in maintenance cost will mean a cool saving of $5 million. That's the goal many progressive carriers are shooting for, convinced that maintenance still offers the most fertile field for cutting operating costs.

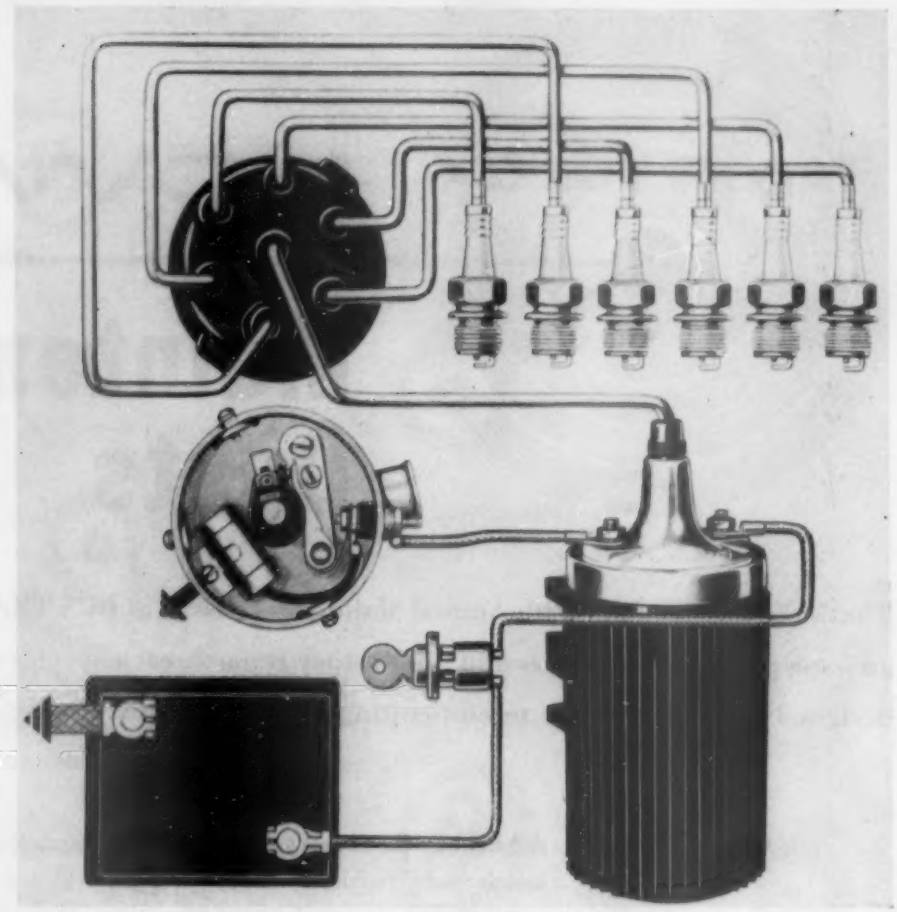
Lower maintenance costs is the target for '54, and it is BUS TRANSPORTATION's objective to help carriers accomplish this end. Articles in this issue discuss in detail what progressive shops are doing to improve maintenance efficiency, reduce waste in both manpower and materials, and generally get more miles per shop dollar.

Target ideas to be found in this issue cover such things as . . . Front Wheel Alignment . . . Checking Diesel Fuel Injection Systems . . . Trolley Bus Maintenance . . . What Makes a Good Foreman . . . Testing, Adjusting and Maintaining Ignition Distributors . . . Annual Buyers' Guide . . . Tuneup Specs.

See the next 35 pages for ideas on how you can hit the target for '54 ➔

TARGET FOR '54

LOWER MAINTENANCE COSTS



Delco-Remy step-by-step procedure shows how . . .

Periodic Inspection Checks Add Life to Your Ignition System

● **Getting peak performance and longer life from your ignition system will help cut your maintenance costs. Here are some worthwhile hints on how to get the most out of the Delco-Remy ignition system.**

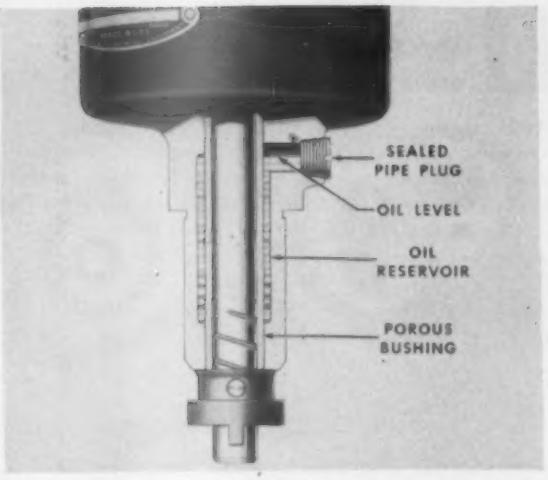
ESSENTIALS OF GOOD MAINTENANCE procedure are periodic lubrication, inspection of distributor contact points, centrifugal and vacuum advance mechanisms, connections and cables, distributor cap and rotor.

Use a distributor tester regularly, and test ignition coils and condensers on testers designed for that purpose.

The contact point opening and cam angle should be checked and adjusted, and the distributor timed after re-installation.

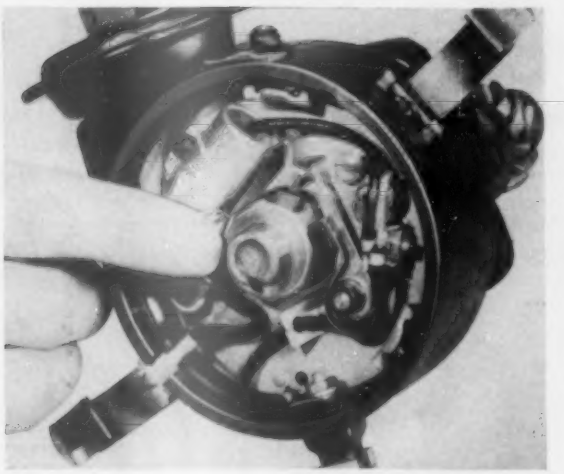
Other items: examine cables for brittle or cracked insulation and broken strands. Defective insulation will cause missing or cross firing. See that connections are clean and tight.

Spark plugs should be removed and checked for cracked porcelain and for excessive gap growth. Refer to the manufacturer's service instructions for details of spark plug service.



1 Method of lubricating distributor shafts depends on the model

In the oil-reservoir type, refill with grade 20 W oil every 10,000 miles or 200 hours of operation. Distributors with grease cups should have cups turned down one turn every 5,000 miles and refilled as required with No. 2½ grease. Hinge cap oilers should be filled with grade 20 W oil at each vehicle lubrication period. Repack sealed tachometer or governor drive gear chambers with No. 2½ grease each 25,000 miles. Gear chambers equipped with grease cups require addition of one full cup of No. 2½ grease every 5,000 miles.



2 Breaker cams need lubrication after 5,000 miles of operation

A trace of cam and ball bearing lubricant should be used for this purpose. This procedure does not apply to distributors having cam lubricators. On these models grease the cam every 10,000 miles. Install new cam lubricator if felt appears stiff or dirty. Every 5,000 miles put one or two drops of light engine oil on the breaker pivot and three or four drops on the felt wick under the rotor. Avoid excessive lubrication. If too much oil is used, the excess is apt to get on the contact points and cause them to burn.

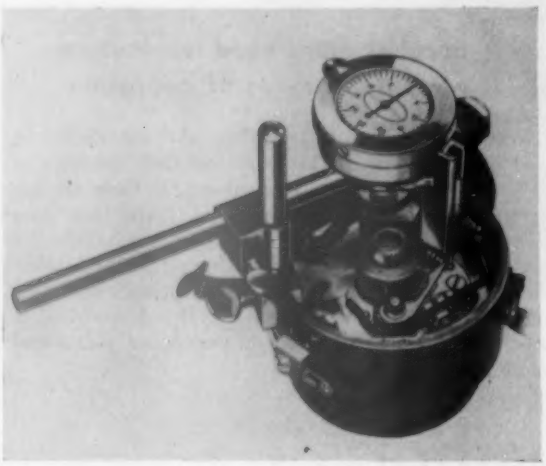
3 Centrifugal advance mechanism should be checked for freeness

This can be done by turning the breaker cam in the direction of rotation and then releasing it. The advance springs should return the cam to its original position without sticking. This check provides information on the condition of the advance mechanism but does not supply specific performance data. To obtain this, the distributor must be tested on a distributor tester.

Continued on next page

4 Vigorous wiping with clean cloth will uncover defects

Accumulation of grime on inside of distributor cap can cover up defects. Wipe out the cap with a clean cloth and then inspect the cap and rotor for chips, cracks and carbonized paths which would allow high-tension leakage to ground. Parts having such defects require replacement.

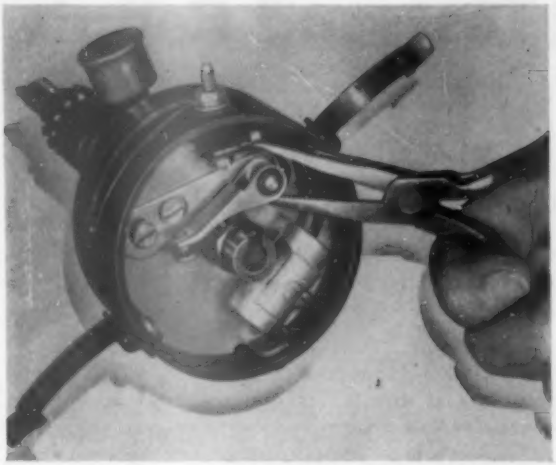


5 Feeler gage should be used to check point opening

This applies to the point opening of new points. On older rough points the use of a feeler gage is not recommended because the gage would measure between the high spots on the points instead of the true point opening. Point opening of used points can be checked satisfactorily with a dial indicator.

6 Use screw driver to get quick adjustment of contact point

The adjustment of the contact point is made by loosening the lock screw and turning the eccentric screw. But remember: tighten the screw well after the adjustment is complete.

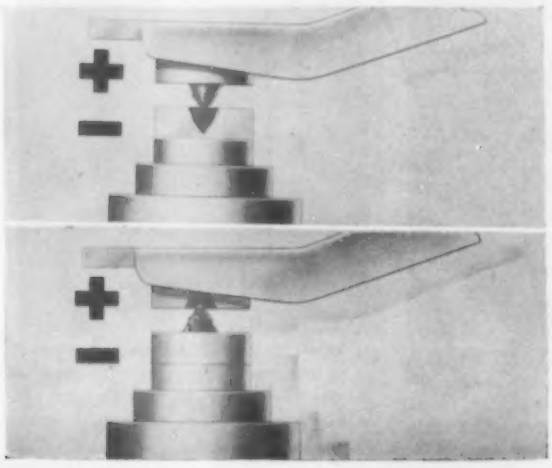


7 Correct contact point pressure is vital to peak performance

Contact point pressure should be 17 to 21 ounces if measured at the centerline of the contacts. If it is necessary to hook spring scale behind contact point, reading should be 19 to 23 ounces. Adjust pressure by bending breaker lever spring. Check spring tension of all new levers when installed. Excessive contact pressure causes rapid wear of block, cam and contact point, while low contact pressure permits high speed bounce, causing arcing and burning of the points and missing of the engine.

8 Smudgy line under contact points can result in rapid burning

A smudgy line indicates that oil or crankcase vapor is getting between the points. Contact burning will result from high voltage, presence of oil or other foreign material, defective condenser and improper point opening adjustment. When burned contacts are replaced, the cause for them should be investigated and eliminated to prevent future failures of the same kind.



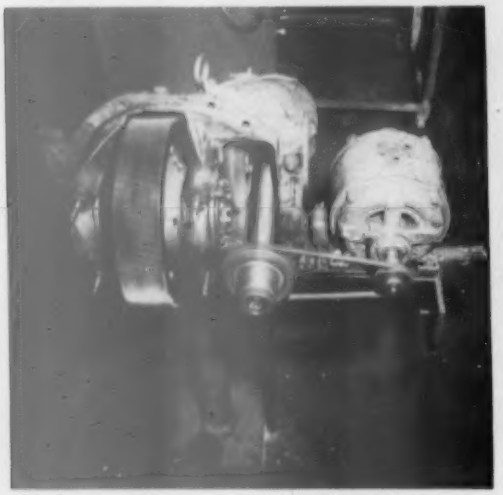
9 Unbalanced ignition system will result in pitting of contact points

A close check of the balance of the entire ignition system should be made to prevent pitting of contact points. If material transfers to the positive contact, the condition may be improved by separating the low and high tension leads, or by moving the low and high tension leads closer to the ground. If material transfers to the negative contact, the condition may be improved by doing just the reverse of above.

TARGET FOR '54
LOWER MAINTENANCE COSTS

How to Test and Repair

When Atlanta Transit switched to this system it cut shop time on differentials way down . . . and at the same time increased their life by 50 per cent.



HERE'S HOW TO TEST DIFFERENTIALS under road conditions on a shop-built road stand.

Mount the assembled differential on the test stand. Paint the gears with red lead. Mount a pulley from a discarded fan or water pump on the through shaft. The ½-inch V-belt on a 2 hp motor is then put on the pulley.

Set the differential in motion and allow it to run. Listen for noises . . . observe the meshing of gears . . . the smooth running of bearings.

Stop the motor and inspect gear meshing as indicated by contact marks in the red lead.

If bevel gears mesh too far from toe the bevel gear must be moved out by adding shims. If mesh is too far from heel shims must be removed. These shim adjustments are made on bearing cage.

To retain proper backlash, compensation may have to be made on the pinion gear.

This is done by adding or removing shims behind the bearing cage. Backlash is set as close as possible to 0.005 inch, so that ample wear up to the maximum of 0.009 to 0.011 is provided.

DIFFERENTIALS ON TROLLEY BUSES are giving 50 per cent longer life at Atlanta Transit since it set up a new schedule of unit changes and overhauls.

It means a huge saving in shop costs, because with 380 trolley coaches on its system, differential overhaul was a major shop item in Atlanta.

Since the new plan went into effect last year, that cost has been cut down. Here is how differential overhaul was scheduled during the past four years.

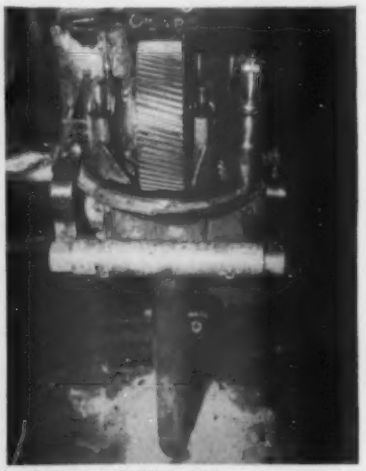
Year	Total Number	Per Month Average
1950	93	7.75
1951	168	14.00
1952	152	12.50
1953	126	10.50

The downtrend last year on making changes and parts replacement only when necessary has continued during this year.

The new system went into effect after a survey of shop operations and scheduled preventive maintenance.

The old system was to yank trolley coach differen-

10 steps show how to repair differentials



1. REMOVE DIFFERENTIAL and mount it on a shop-made stand. For easy handling the stand base swivels so the differential can be held in any position, giving quick access to all parts.

Trolley Coach Differentials

tials every 100,000 miles. If bearing, oil seals and other parts subject to heavy wear appeared unable to go another 100,000 miles, they were replaced.

But Atlanta Transit found that many parts still had more miles of service in them. Replacing these was expensive in both labor and parts.

In fact the cost was considerably higher than the risk of a road failure.

Maximum mileage was the goal of the new system. Several different units were kept operating until noise developed or a bad oil leak occurred.

The results were surprising. Average mileage was upped to around 150,000 miles before a unit change was necessary.

Other advantages were developed when the new system started:

1. Atlanta Transit now junks parts only when absolutely necessary. For example, if one or two teeth are chipped on the "bull" or ring gear, the part is permitted to remain in service.

Since the spur pinion and ring gear must be purchased in matched sets, costing about $150 a set, this extended life is highly profitable.

2. The company has combed over its discarded parts pile and reclaimed all differential gears and shafts.

Tests will be made to fit gears to matched sets . . . something which has never been done before. This new experiment is possible because beveled gears and through shafts can be purchased separately.

3. Experiments were conducted with the use of two oil seals together. It was found that the outer seal did not get sufficient lubrication to combat the heat . . . but the experiments still were useful.

As a result of them, Atlanta began to use a new type seal, made of a synthetic rubber-asbestos compound. It's been found to have greater resistance to heat and a longer wear life.

Also, a new type clipper seal is being used to replace original seals.

There are three keys to getting longer life from trolley coach differentials, Atlanta has found.

- Proper lubrication.
- Setting the original backlash at the minimum tolerance possible.
- Watching bearings carefully.

When a bearing goes bad the angle of attack of gears changes and uneven wear or failure results.

When it's necessary to overhaul differentials, Atlanta shop men do a thorough job, using a variety of tools developed right in the shop.

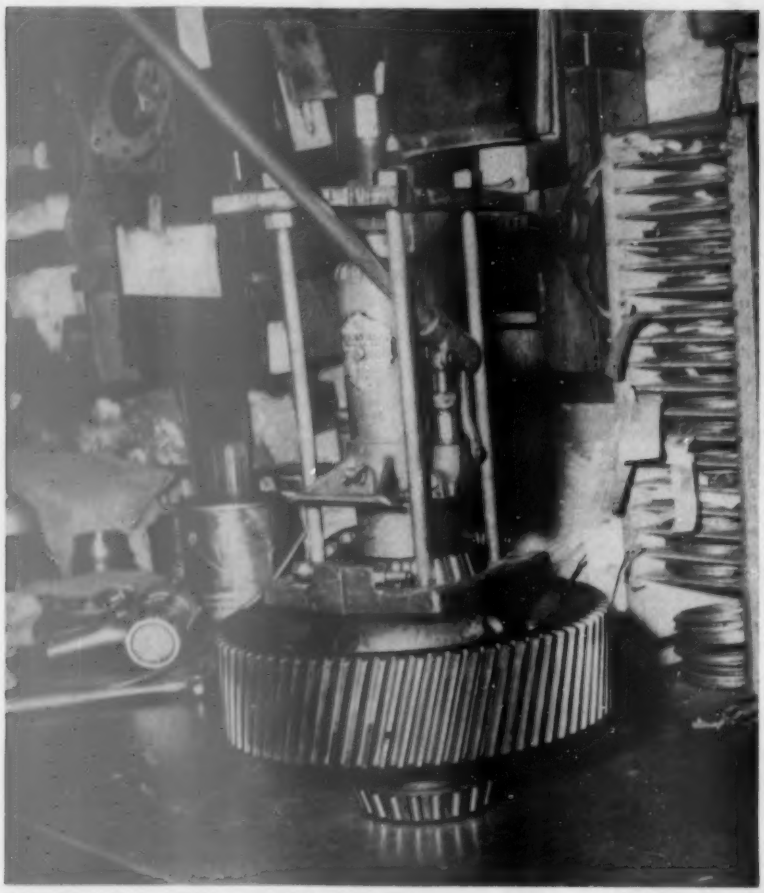
The pictures below and on the following pages show how Atlanta overhauls and tests differentials, and some of the special equipment that helps them keep costs down and performance up.

2. TAKE OUT BEARING adjusting ring and bearing cup. Check closely to see that the cup revolved in the housing . . . look for pits in the cup. Worn bearings mean noise and uneven gear wear.

3. YANK THE RING GEAR, or "bull" from the housing, using an overhead hoist and rope sling. It's easy, safe, quick, and eliminates damage. Next, clean the gear assembly . . . put it on work bench.

4. INSPECT RING GEARS for uneven wear, indicating improper mesh setting or worn bearings. Look for rough spots in raceways or rollers. Discard badly worn bearings.

Continued on next page



5. REPLACE DEFECTIVE BEARINGS. Use a shop-made bearing puller. The one above, embodying a Blackhawk hydraulic five-ton jack, was made in the Atlanta shop. It makes a hard job easy . . . prevents injury to expensive parts.

6. DISASSEMBLE DIFFERENTIAL. An impact wrench speeds the job, but if hand wrenches are used they should fit nuts perfectly to prevent damage.

7. REMOVE SHAFT PINION GEAR with pull bolts. Tighten upper and lower evenly so gear will slide out smoothly.

8. TAKE OUT CAGE ASSEMBLY carefully, in order to prevent injury to the shims or damages to the outer surfaces, caused by scraping them against the differential housing during removal.

9. REMOVE THE CROSS SHAFT from the main bearing. To make the job easier use a puller. The one used in Atlanta is made from a salvaged cage assembly cover with a metal plate attached.

10. PRESS OUT inside bearing cup. Atlanta does it with an arbor press and a shop-made device consisting of three discarded bearing cups welded together as a base for the bearing cage.

TARGET FOR '54
LOWER MAINTENANCE COSTS

When tire mileage kept going down the Connecticut Company set out to do something about it. Experts were called in . . . experiments made. They found out that a . . .

Wheel Balancing Program Helps Increase Tire Mileage

TIRE MILEAGE was dropping fast on Connecticut Company buses . . . until a wheel balancing program stemmed the downtrend and sent mileage climbing upward again.

The trouble started late in 1952, when total tire mileage started leveling off, and mileage on front tires was erratic and decreasing.

This was something new, as year after year since the war the Connecticut Company tire average had been going up and up consistently.

There were no apparent reasons for the change. But it reflected in tire cost per mile because of the bonus clause in the contract . . . and the company set out to find the cause.

In seeking a cure for its headache Connecticut Co. sought the advice of the vehicle manufacturer, the tire supplier and other bus operators in the area.

In its own shops, every possible source of trouble was checked and double-checked. Wheels, springs and steering gear were probed . . . front end geometry was reexamined . . . and tires, brand new and old worn ones, were carefully scrutinized.

Out of it all Alden Williams, superintendent of equipment recently promoted to assistant general manager, came to this conclusion . . .

No single factor, but a combination of several factors, was responsible for the drop in tire mileage.

Remedial measures in the form of a revamped wheel alignment program and the addition of a wheel balancing program were indicated. This program is carried out at the regular 3,000-mile inspection.

For wheel alignment the Connecticut Co. uses three different devices—"weegee" boards . . . a Weaver machine which works on the "weegee" principle . . . and "stick" gages, which are preferred by the tire supplier.

In cases of discrepancy between the "stick" gage method and either of the other two devices, a recheck is always made.

At the Connecticut Company, front wheel toe-in is set at from zero to 1/16 inch. Alignment practices in general follow much the same procedure as do those in any other modern bus shop.

On the wheel balancing phase, the company has been doing a thorough job now for more than a year.

Their approach has been to balance the hub and drum assembly as a unit and the wheel as a unit . . . rather than the complete tire, wheel, drum and hub assembly as a whole.

In this manner it hasn't been necessary to rebalance the assembly when the front tires are alternated at 6,000-mile intervals. If the tires are in balance, no further balancing is necessary.

The reason for balancing the entire wheel assembly is to correct any out-of-balance of the tire casing, tube and flap. In the few instances where extreme out-of-balance is found, such tires are used only on rear wheels.

After one year of this setup, the Connecticut Company firmly believes that . . .

Balancing isn't everything . . . but it's the key

To back up that belief, Alden Williams points to an increase in the fleet average tire mileage from 68,618 per tire in the pre-balancing days to a current performance of 70,843 miles per tire.

And even better performance is anticipated when the company begins to reap the full benefits of its front end program.

The wheel balancing portion of that program is the "something new" that was added by the Connecticut Company, which, along with many others, had previously considered wheel balancing unnecessary on buses operating in moderate-speed city service.

But results have changed that belief. Used in conjunction with the front end program, wheel balancing has more than proved its worth in increased tire mileage . . . lower tire costs.

Now turn the page for a step-by-step account of how the Connecticut Company handles its wheel balancing program→

"Wheel balance is checked right on the bus

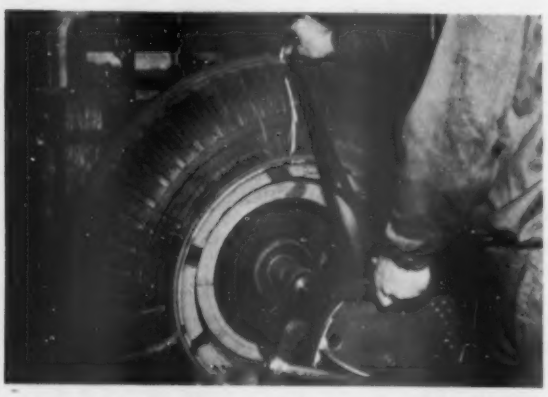
1. Alignment and balance are checked every 3,000 miles. At left, front wheel alignment is checked with a Weaver machine. Above, a Bull's Eye wheel balance gage is used.

"Another balance check is

WHEEL BALANCE WEIGHTS are cut from bar stock ½ x 1½ in. The following table gives the weight equivalent in ounces of various lengths of stock:

½"	1¾ ounces
1"	3½ ounces
1½"	5¼ ounces
2"	7 ounces
2½"	8¾ ounces
3"	10½ ounces
3½"	12¼ ounces
4"	14 ounces
4½"	15¾ ounces
5"	17½ ounces
5½"	19½ ounces
6"	21 ounces

6. Bull's Eye gage is brought into play again. Here the mechanic is sliding the weight along the scale, permitting him to read the exact amount of unbalance, indicated in ounces.



7. The tire is marked with chalk, exactly as it is when the balancing is done on the bus. Chalk marks indicate the points at which weight should be applied to counteract imbalance.

at every regular 3,000-mile inspection"

2. Gage shows the wheel is out of balance, but the trouble can be easily corrected by the application of weights at the points indicated by chalk marks made by the mechanic.

3. The wheel is in balance again, after the necessary weights have been applied to the rim. A recheck is made with the gage to assure that wheel will roll free and true in service.

made whenever a wheel is taken off a bus"

4. When a wheel is removed because of tire damage or any other reason, this Globe wheel dolly speeds the job safely. Worm wheel operated elevator eliminates heavy lifting by shop men.

5. Chain hoist lifts wheel assembly onto this balancing stand so that balance check can be made. The stand permits the entire assembly to revolve freely.

8. Weights are applied to wheel rim. Each weight is identical with the amount of unbalance and each is applied 120 deg apart from each other and from the unbalanced area of the wheel.

Those are the steps in balancing wheel assemblies, on and off the bus. Now turn the page for the other half of the balancing job done by Connecticut Company→

Balancing a hub and brake drum assembly in easy steps

1. Hub and brake drum balance are checked with a Bull's Eye gage. This brake drum is seven ounces out of balance.

2. Seven-ounce counterweights have been applied 120 deg apart to restore the assembly to perfect balance.

3. Entire wheel assembly is buttoned up with an Ingersoll-Rand pneumatic wrench. To be on the safe side, it will be checked for balance again before it goes on a vehicle.

4. Even new tires may be out of balance. Here a brand new tire is checked with a gage before being mounted.

5. Special spanner to support tire on mandrel of the balancing machine was designed and built in the shop.

Here are 17 pointers aimed at . . .

Making Better Foremen

"How can foremen do their jobs better?" This question, asked of excutives and shop superintendents throughout the industry, brought these suggestions and recommendations.

Analyze the abilities of each worker and plan jobs so vital ones go to the individuals most suited to them. Don't give a slow worker a rush job, or a careless worker an exacting one, unless you happen to be in the mood for experimenting.

Get proper tools for your men and see that they are kept in top-notch working order. Insist that drills, cutters, etc. are kept sharp . . . that chisels are deburred . . . that handles are solid. You'll cut accidents and up the production curve.

Define authority and responsibility for every worker . . . and back up that authority. Don't countermand leadman's orders to "show who's boss." And don't countenance evasions by anyone.

Choose leadmen for supervisory ability as well as technical knowledge. All other things being equal, the best leadman is the natural group leader—one the other men instinctively follow. Be sure you turn that talent into useful channels.

Know general company policies. Improve operations and relations with other departments by following policy when defined . . . asking for definition when it isn't.

Take care of the "green hand." More potentially good employees are lost through inattention than through any other cause. Remember your own experience when you first went to work—and extend a helping hand. Show the new man where things are . . . introduce him to other employees with whom he'll work . . . and explain fully to him what's going on in the department.

Train everyone for advancement. Show them other operations, other jobs, how to set up their own and other work. The foreman who trains somebody to take his own job won't be pushed out—he'll be pushed up.

Don't assume a superior or secretive air, and give seemingly senseless or arbitrary orders. A worker is likely to do a better job if he knows why he's doing it.

Set an example. Don't expect to have privileges or take liberties because you're the boss. You'll find that grown-ups imitate as readily as children.

Be a counselor, not a judge. The sooner that attitude is clear to those who work for you, the sooner you'll have their respect and confidence. And the sooner you'll be able to clear up personnel problems that disorganize departmental morale.

Be a friend as well as a foreman. It's none of your business what employees do outside working hours . . . unless it affects their work. Then it becomes very much your job to stop or correct anything that lowers morale.

Plan work assignments to keep a steady flow. Don't build up backlogs of one item at the expense of others. Interchange fast and slow workers on long and short jobs to keep output uniform.

Maintain discipline. Horseplay and foolishness caused more trouble and damage than sabotage during World War II. An occasional joke or reminiscence relieves tension, but too many cause inattention, unnecessary errors and lowered production.

Don't make promises you can't keep . . . and don't pick favorites. Take your subordinates into your confidence whenever possible, and they'll have more confidence in you and in the company.

Know when to yell "help." Service and supervisory personnel are paid to help you—use them. Don't be a weak sister and forget you have a brain and a mind of your own, but if something comes along that's too big or too new, don't hesitate to ask for help. It won't hurt your reputation . . . and may avoid a lot of trouble at a later date. Remember that nobody can possibly know everything.

Keep promotions in line with capabilities. Be sure ability and production are considered in promoting. Don't be swayed by sales talk, sob stories, or membership in the same lodge.

Mind your own business . . . but be sure you realize that everybody working for you is your business. Don't be a snoop, but by the same token don't be so aloof that you can't show an interest in what's going on. As a general rule, men much prefer to work for a foreman who is obviously very much aware of everything that takes place in the shop.

TARGET FOR '54

LOWER MAINTENANCE COSTS

Floor maintenance costs can be cut by adopting . . .

The Right Way to Lay a Bus Floor and Make it Stick

PURCHASE OF THE BEST bus floor covering, together with the use of proper installation methods, will materially reduce overall vehicle maintenance costs.

To get ideas on the best way to do a bus floor job, BUS TRANSPORTATION editors went to the engineers of Samuel Moore & Co., producer of flooring material.

Obvious fact: adequate maintenance of floors will minimize the need for frequent replacement, thereby reducing maintenance costs. There are several maintnance rules:

1. Regular use of broom and damp mop to clean floor.
2. Don't use excessively strong cleaning solutions.
3. Remove salt tracked into vehicles in wintertime.
4. Don't let oil and grease remain on the floor.
5. Don't use petroleum base insecticides.
6. Repair breaks in gap sealers immediately.

But . . . When new floor covering is needed, follow the installation method in the photo sequence on these pages.

1. REMOVING OLD COVERING is the first step. To break adhesive bond, special heating units can be used. Unit shown above equals aisle width, has industrial infra-red lamps to supply heat.

2. BLADE-LIKE TOOLS can be used to pry up old covering, and painter's naptha will assist in breaking the bond. This is the most practical method to use for very small patches.

3. CLEANING the exposed plywood is next, followed by sanding of rough spots to insure good bond. Before applying cement, the surface should be brushed or air blown to remove all loose particles.

4. CEMENT CAN BE LAID with small or large brush and, for speedier application, with rollers or spray equipment. Cement coat should be uniform, but not heavy. This helps speed drying time.

5. COATING OF CEMENT on back of floor covering (cut to size) will insure permanent adhesion to floor. Cement on both covering and wood floor should set until it becomes tacky.

6. LAYING OF AISLE STRIP should be done carefully. After cement on back of strip and the wood floor has become tacky, strip is rolled, carried into coach and unrolled in place, starting from the rear of vehicle. Small side strips are laid last.

7. AN ADEQUATE GAP (3/16 in.) between aisle strip and side pieces, with plenty of sealer, will keep out dirt and moisture.

TARGET FOR '54
LOWER MAINTENANCE COSTS

Basic Three-Step Program Maintenance of Diesel Fuel

THE DIFFERENCE between the diesel engine and the gasoline engine lies primarily in the preparation of the fuel and air prior to combustion, and in the method of ignition.

The gasoline engine draws in a mixture of fuel and air which was previously mixed to proper proportions in the carburetor. The mixture is compressed to about one-seventh its volume and then ignited by an electric spark.

The diesel engine draws only air into its cylinders which is compressed to about one-fifteenth its volume with a consequent rise in temperature. Fuel is injected into the cylinder at the end of the compression stroke. The high temperature of compression causes the fuel to ignite spontaneously.

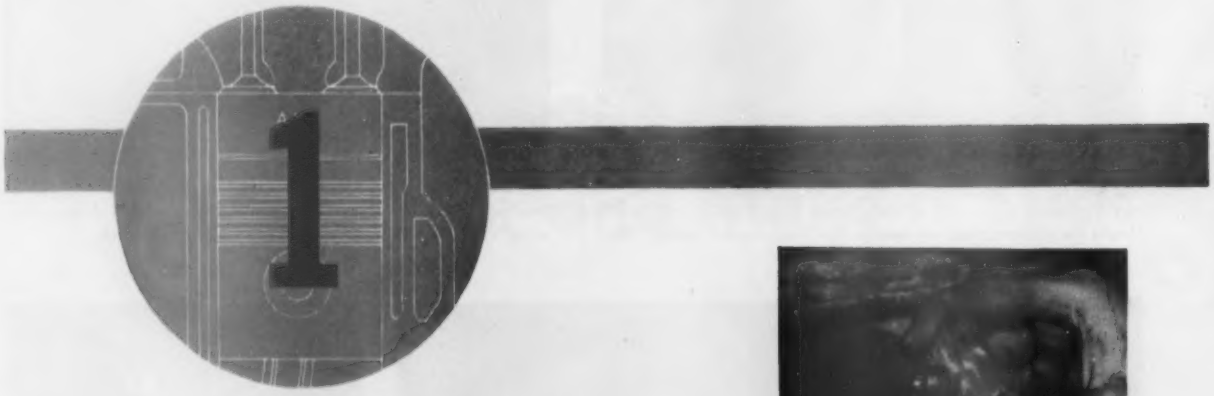
Simplification is the keynote of the diesel engine, compared to the gasoline engine, since no carburetor or electrical ignition system is required in a diesel.

However, certain parts not found on a gasoline engine are required by a diesel to accomplish metering and introduction of the fuel into the cylinder. These parts make up the fuel injection system.

The function of this system is twofold. First, it must deliver the correct amount of fuel to the cylinder at the right time.

Second, it must atomize the fuel, introducing it into the cylinder in the spray pattern best suited for the particular engine design. These two functions combined with the compression method of ignition are the three important factors basic to the diesel which merit special maintenance attention.

The two functions of fuel injection may be accomplished in several ways. However, fuel injections systems may be grouped into two classifications.



CYLINDERS—Proper ignition of fuel by high compression temperature

The first requirement of good diesel performance is a sufficiently high compression pressure before the piston reaches its highest position when the fuel is sprayed into the cylinder.

It is the intense heat of this highly compressed air which causes ignition of the spray, without the aid of electrical ignition devices.

Compression pressures must be measured at engine operating idling speeds. Do not take compression pressure by cranking engine with the starter. A diesel compression tester should be used.

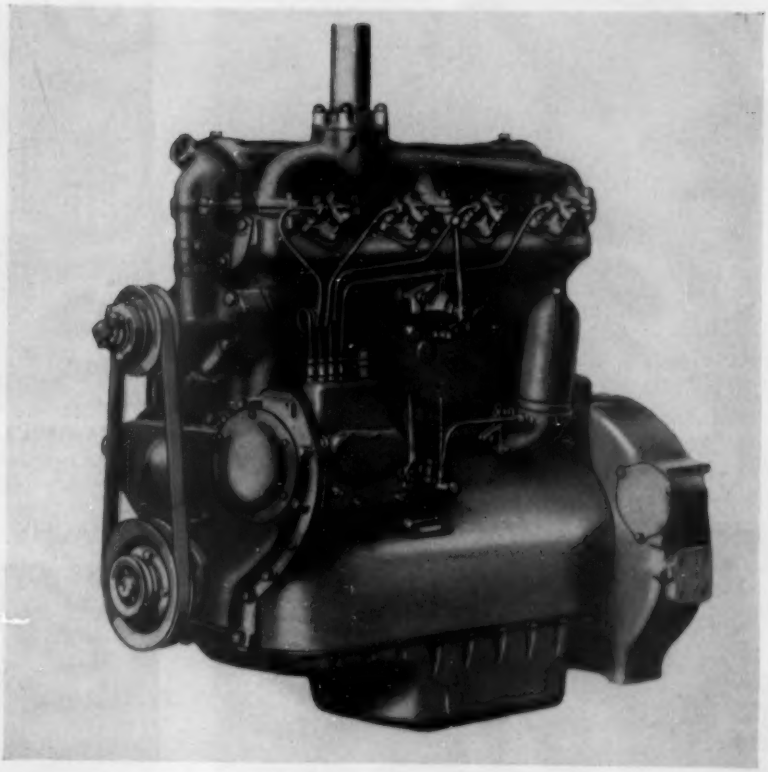
START ON CYLINDER NO. 1. Remove fuel lines from nozzle or injector and take out the nozzle. Re-assemble the fuel lines so as to permit the fuel to flow directly to the return line.

for Good Systems

The first comprises the systems, such as American Bosch and Cummins, in which metering of the fuel and its introduction into the cylinder is done by two units, the fuel pump, and the injector.

The second group employs unit-injectors in which both functions are combined in a single component. General Motors unit injectors are typical of this second group.

Editor's Note: This article was prepared exclusively for BUS TRANSPORTATION *by the engineering staff of Bacharach Industrial Instrument Company, of Pittsburgh, Pa.*



INSTALL THE ADAPTER of the compression tester in cylinder opening for the injection nozzle. Adapter is held in place by the same means used for holding the nozzle or injector.

CONNECT COMPRESSION TESTER to the adapter. Care should be taken to avoid getting sharp bends in the flexible hose connection between the adapter and the pressure gage.

RUN ENGINE at operating or idling speed as specified by maker. Gage is read when pointer stops rising. Highest reading represents compression pressure.

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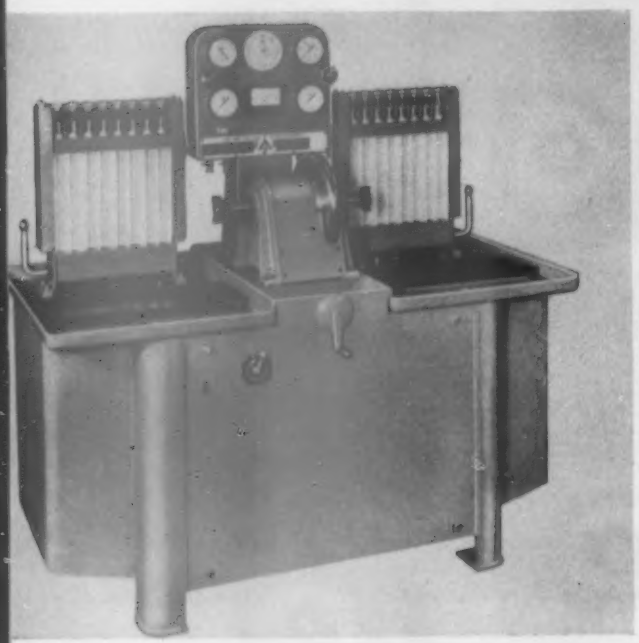


INJECTION PUMPS—

Metering and timing of fuel delivery

Second basic factor of efficient diesel operation is the injection of the right amount of fuel at the right time.

This quantity control is accomplished with a pump. Different types of pumps require different adjustment procedures.

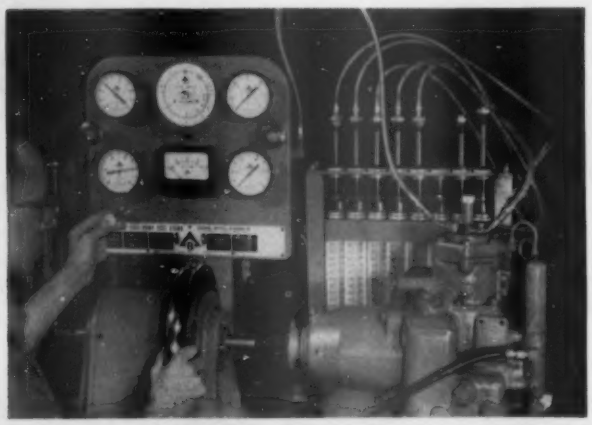
However, all require two basic adjustments: The timing adjustment to insure fuel delivery will start at the same number of degrees before TDC in each successive cylinder in the firing order; and the calibration adjustment to insure that equal amounts of fuel are delivered to the cylinders.

Testing for precise measurement of speeds, flow rates and movements of internal pump parts is essential. The proper equipment and steps for testing of American Bosch and other similar multi-plunger pumps, as well as Bosch and Cummins distributor type pumps, and the GM Series 71 injectors, are shown on these two pages.

AMERICAN BOSCH

CONTROL RACK MOVEMENT is precisely measured on this fuel pump calibration stand to determine the rack setting at which fuel delivery begins.

CUMMINS



HEAD PRESSURE of fuel pump is checked to determine point at which the distributor disk and cover separate.

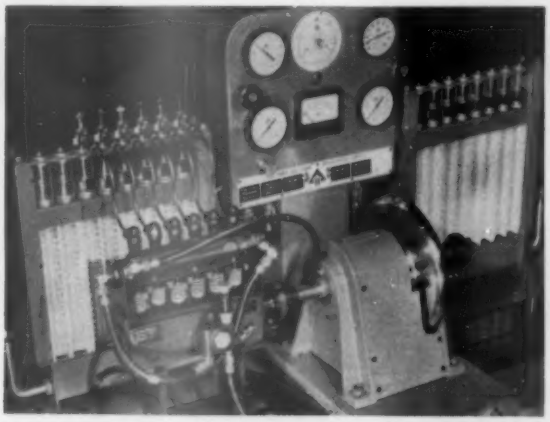
GENERAL MOTORS

The GM injector incorporates a fuel injection pump and spray nozzle in a single unit.

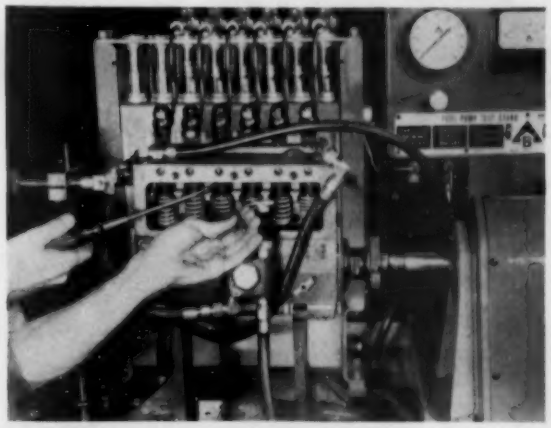
Proper timing and balancing of fuel delivery are accomplished by establishing proper relationship between all the operating parts by means of precise measurements after the injectors have been installed on the engine.

However, it is certainly good practice to run a calibration test before the installation to ascertain that accurate balance in fuel delivery and thus equal distribution of the load will be maintained throughout the normal operating range.

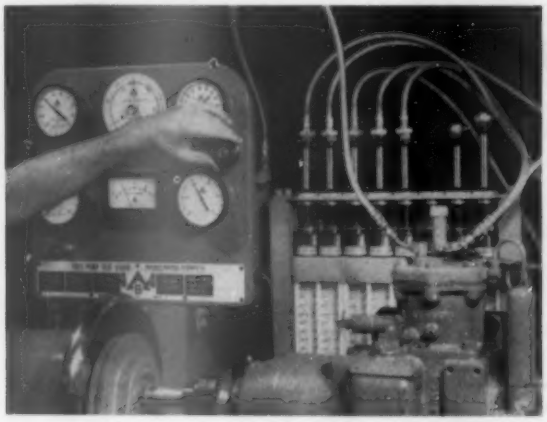
Timing adjustment involves proper positioning of the pump plunger in relationship to the injector body. A timing gage is used for this purpose. Balancing of the fuel delivery is accomplished by adjusting the injector control racks for proper position in relation to the governor. No special tools are required for this purpose.



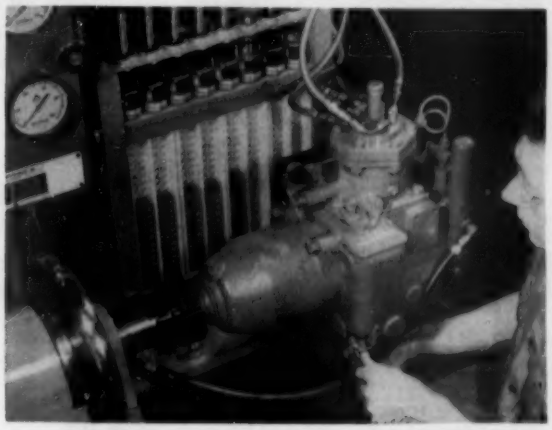
MANIFOLD PRESSURE of fuel supply pump is checked here to assure adequate delivery pressure at all pump speeds so that delivery is not too great nor too small.



FUEL DELIVERY of each plunger unit and their combined deliveries is checked at two widely separated speed ranges to assure that equal amounts of fuel reach each cylinder.

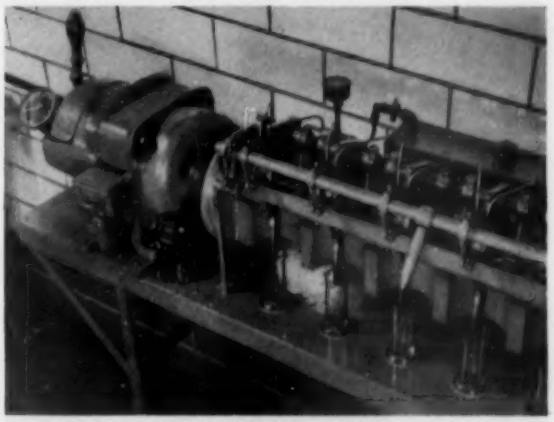


FUEL PUMP is checked for maximum fuel delivery and for governor "cut-off" action at rated speed.



PUMP PRIMING stage of test, with built up pump pressure to show 80 or 90 p.s.i. on the pressure gage.

INJECTOR TIMING is carried out with injectors installed in engine. With special gage, the injector plunger follower is adjusted to proper position relative to injector body.



MOTOR DRIVEN CHECKING FIXTURE measures amount of fuel delivered by each injector of the set prior to installation in the engine.

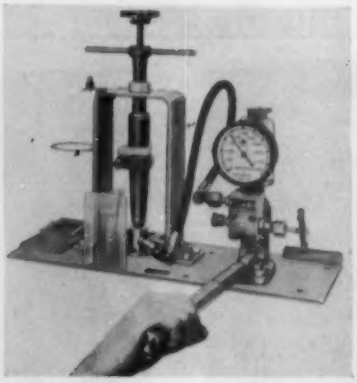
INJECTION NOZZLES—Testing for proper injection of fuel into cylinder

The third important factor in diesel operation is injection of the fuel in a properly atomized spray of a pattern best suited for the particular engine design.

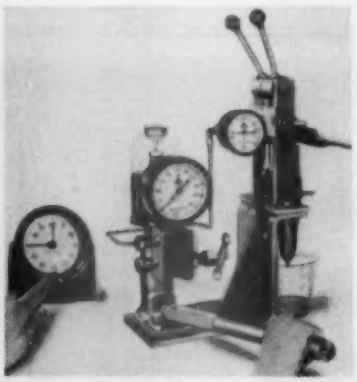
This quality control function of the fuel injection system is performed by the injection nozzle.

Since proper injection of fuel is of foremost importance to satisfac-

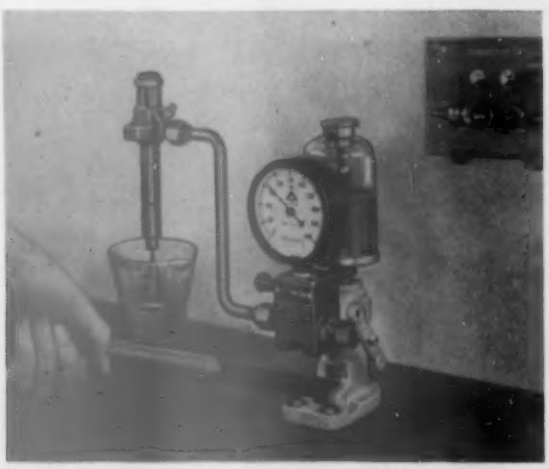
VALVE OPENING PRESSURE on American Bosch nozzle is checked and adjusted. The opening pressure may be raised by increasing the valve spring tension and then lowered by decreasing it.



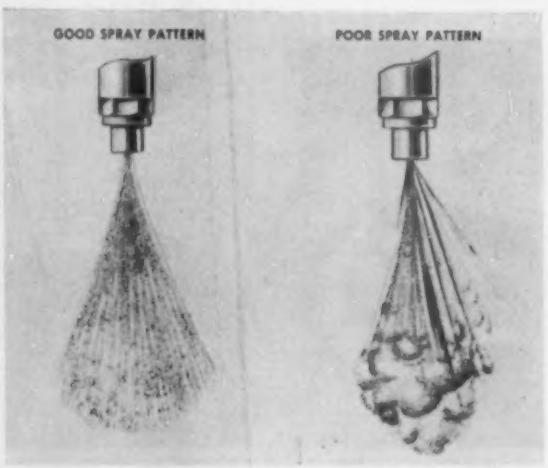
BACK PRESSURE TEST is carried out on the Cummins nozzle. In this back pressure test there should be no observable leakage of fuel at a gage reading of 2000 lbs. per square inch.



HOLDING PRESSURE TEST on GM unit injector. Pressure is built up to 350 p.s.i., then pressure drop is observed. Pressure drop should not exceed 100 p.s.i. in a span of 50 seconds.



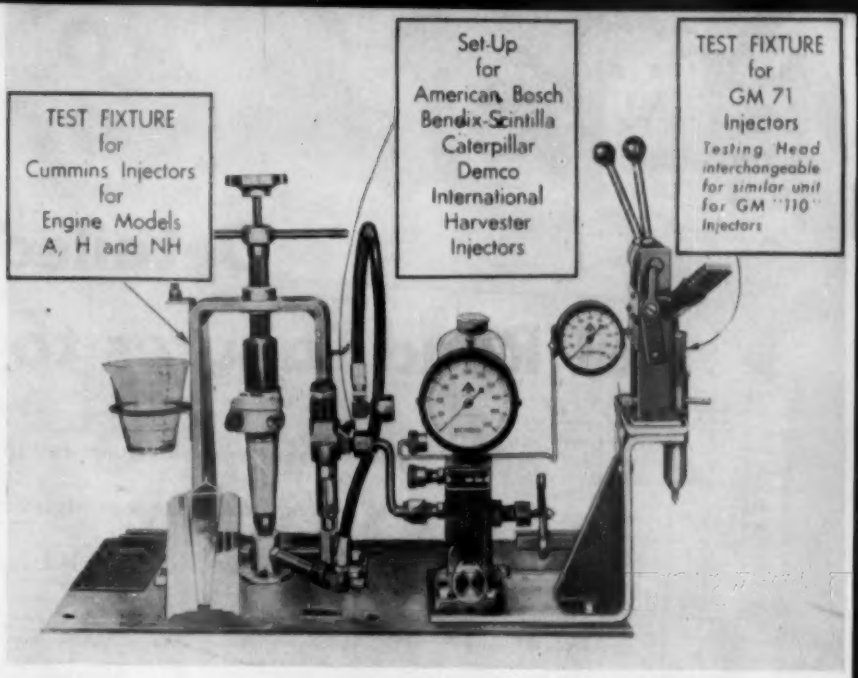
SPRAY PATTERN TEST is being carried out here on the American Bosch nozzle to get proper pattern spread (see right).

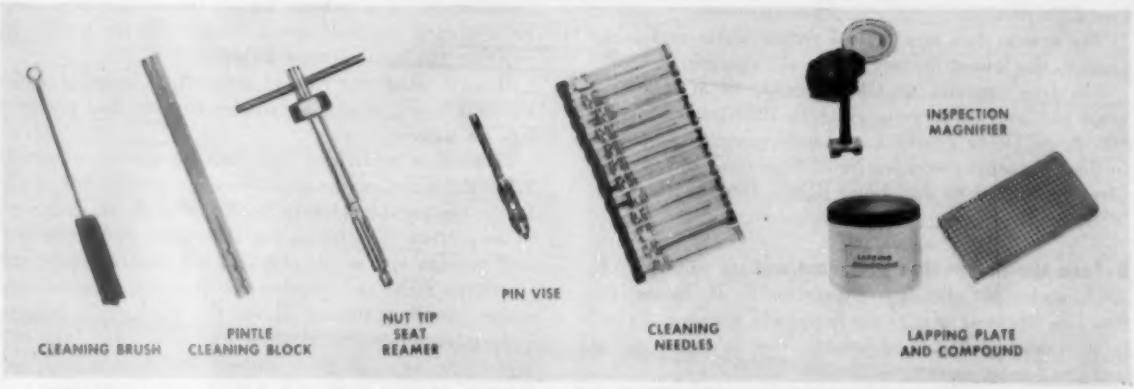


SYMMETRICAL SPRAY (left) shows properly performing nozzle. Irregular spray (right) indicates nozzle replacement or repair.

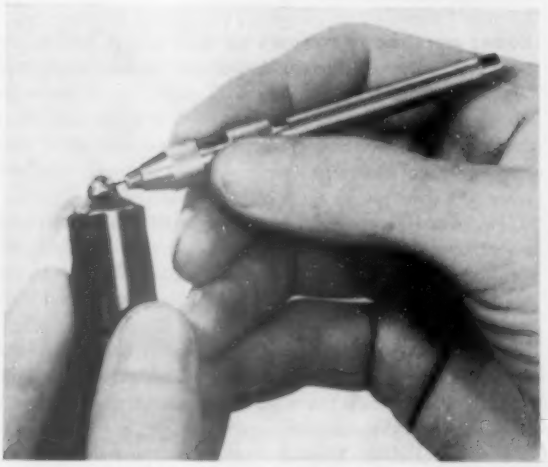
tory diesel performance, preventive maintenance of injection nozzles is the most common service operation on a diesel engine.

The essential servicing equipment comprises a nozzle test stand and special purpose tools for the necessary cleaning and refinishing operations. These include brush, seat reamer, cleaning block, pin vise, etc.

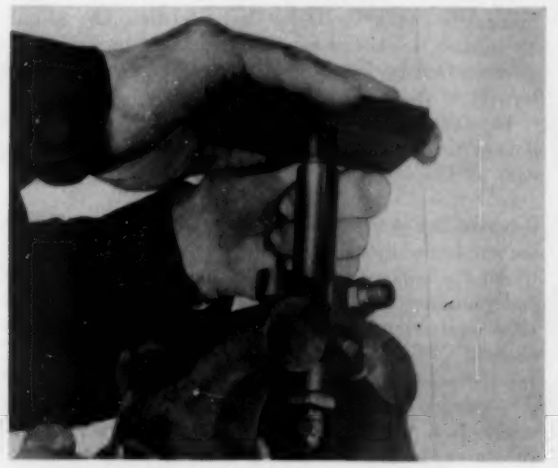

TEST FIXTURE for Cummins Injectors for Engine Models A, H and NH
Set-Up for American Bosch Bendix-Scintilla Caterpillar Demco International Harvester Injectors
TEST FIXTURE for GM 71 Injectors
Testing Head interchangeable for similar unit for GM "110" Injectors



BASIC TOOLS for cleaning and lapping nozzles and injectors include cleaning brush, cleaning block, seat reamer, pin vise.



CLEANING NEEDLE of proper size should be used to clean clogged nozzle holes of multi-orifice type nozzle.



LAPPING OF SURFACES of injection nozzles is necessary to assure a good seal between all the related parts.

TARGET FOR '54
LOWER MAINTENANCE COSTS

Detailed Inspections Cut Road Failures to a Minimum

● Only a year ago San Jose was the poor stepchild of Pacific City Lines. Its road call rate was high . . . its checkups haphazard. Now, with supervised inspections SJCL sets the pace and leads its cousins.

COUPLING DETAILED INSPECTION with intense supervision has reduced road failures to negligible proportions at San Jose (Calif.) City Lines, one of six Pacific City Lines' properties.

The system has also helped reduce parts and labor costs to the lowest for any of the six operations.

San Jose operates 44 GMC diesels, all at least five years old, over seven runs which in 1953 totaled 1,815,308 miles. Other Pacific City Lines' properties operate in the California communities of Stockton, Sacramento, Glendale, Pasadena and Long Beach. Headquarters are in Oakland.

Before the inspection program was set up in March, 1953, under Maintenance Supervisor E. B. Evans, the San Jose line was next to the highest in number of road failures among PCL companies. Now it tops the list with the fewest.

For purposes of definition, Evans terms a road failure as any occasion when a mechanic is called out by a driver, except for fare box or tire repairs and whether schedule time is lost or not.

In January, 1954, there were only seven mechanical failures in 144,000 miles, with a total time loss of only 28 minutes. (Schedule time is often saved by having the mechanic make adjustments or replacements during layover at the end of the run.)

The following month there were only six failures and no lost time. This compared with 21 breakdowns in January of 1953.

Despite the increasing age of equipment at San Jose, the number of breakdowns has been steadily decreasing. Under the impetus of the inspection program, which is just rounding out its first year in its present form, the 1954 road failure total may well be less than half that of 1953's 179. In 1952, 295 failures were chalked up, and the year before that, 326.

Inspection in one form or another has been in effect at San Jose for about ten years. But previously it was loosely supervised . . . left up to the mechanics. Evans was sent out from Tulsa, Okla., by the parent National City Lines to tighten up the program.

Although the company has a regular and efficient preventive maintenance setup, it is not to be confused with the inspection system. PM is concerned with unit replacement on a mileage basis; inspections are made to safeguard the line's good name with the public by averting mechanical road failures.

Items looked for during inspection included leaky radiator hoses, shorted generator brushes and batteries low on water.

Inspection is divided into two categories, minor at 1,500 miles and major at 3,000 miles. Cardboard checkforms are provided for following through on each type of inspection. The forms list each item to be checked, and provide spaces for checking off repairs made, adjustments made and whether the item was in good condition. Another column is for the mechanic's initials.

The form for minor inspection is divided into (1) motor and electrical, (2) chassis and brakes and (3) lubrication of engine and chassis, with a warning not to over lubricate. Altogether, 49 items are covered.

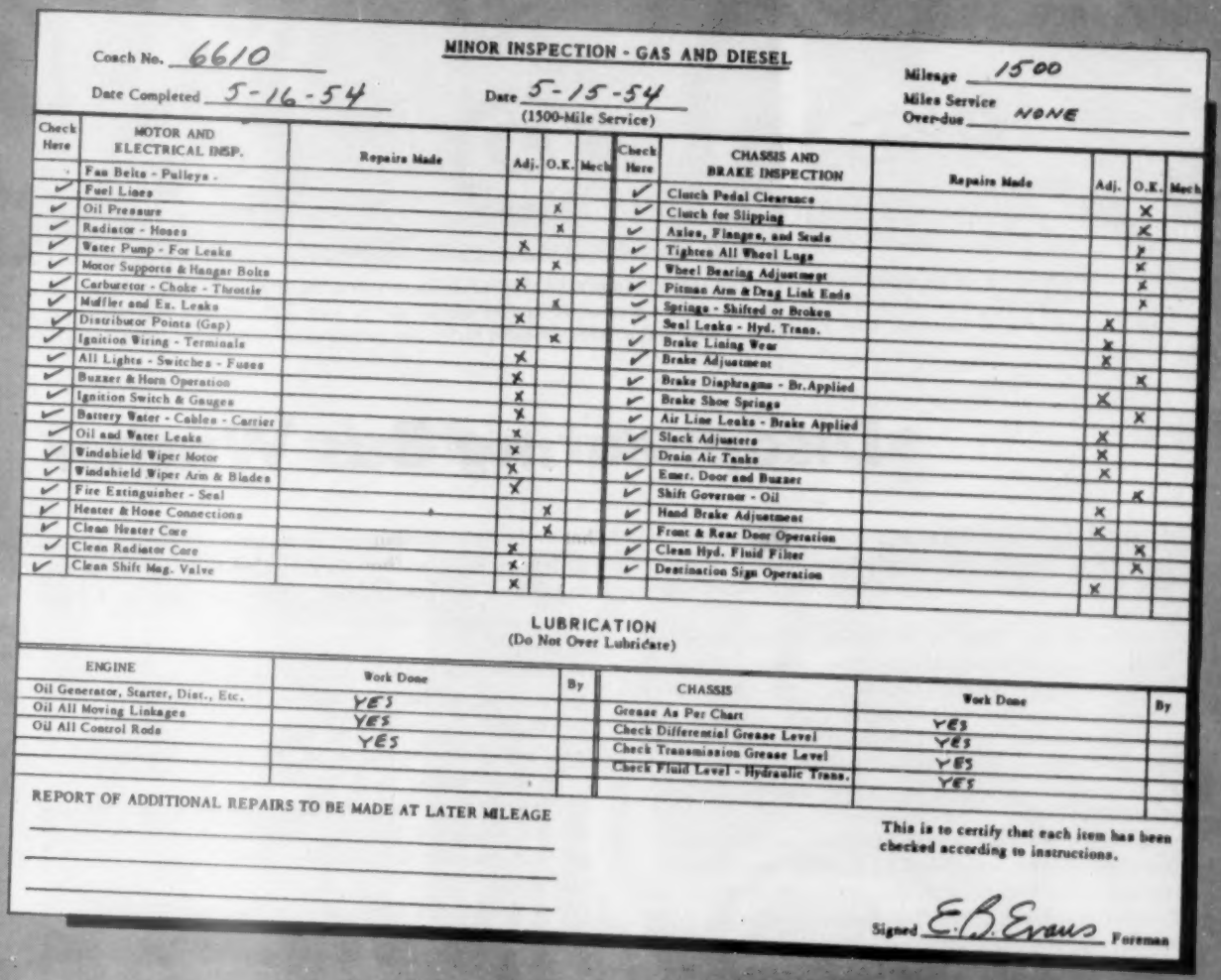
Major inspection covers (1) engine, (2) chassis, (3) electrical system, (4) body, (5) brakes, (6) lubrication and (7) miscellaneous, for a total of 120 items.

Evans personally follows up each major and minor inspection, both in the pit and in and around each bus. While inspection time varies with each bus, it averages about four man-hours for minor checkups and six hours for major inspections, he reports. Two day shift men and one night man are assigned to inspection; only one man at a time works on a bus.

The word "inspection" as used at San Jose takes on a different meaning; it doesn't only mean "to look at" or "to view." Adjustments, repairs and replacements are made where necessary as each item is "scrutinized."

Under this system, the inspection crew takes over a long list of detailed work, leaving the other ten men of the 13-man shop force and the general foreman free for all other shop activities.

Personnel in the shop also includes a storeroom clerk. He is in charge of a parts inventory of approximately $25,000. Evans says, "We are adding to it constantly



Coach No. 6610 — **MINOR INSPECTION - GAS AND DIESEL** — Mileage 1500

Date Completed 5-16-54 — Date 5-15-54 (1500-Mile Service) — Miles Service Over-due NONE

Check Here	MOTOR AND ELECTRICAL INSP.	Repairs Made	Adj.	O.K.	Mech
	Fan Belts - Pulleys -				
✓	Fuel Lines			X	
✓	Oil Pressure			X	
✓	Radiator - Hoses			X	
✓	Water Pump - For Leaks		X		
✓	Motor Supports & Hanger Bolts			X	
✓	Carburetor - Choke - Throttle		X		
✓	Muffler and Ex. Leaks			X	
✓	Distributor Points (Gap)		X		
✓	Ignition Wiring - Terminals			X	
✓	All Lights - Switches - Fuses		X		
✓	Buzzer & Horn Operation		X		
✓	Ignition Switch & Gauges		X		
✓	Battery Water - Cables - Carrier		X		
✓	Oil and Water Leaks		X		
✓	Windshield Wiper Motor		X		
✓	Windshield Wiper Arm & Blades		X		
✓	Fire Extinguisher - Seal		X		
✓	Heater & Hose Connections			X	
✓	Clean Heater Core			X	
✓	Clean Radiator Core		X		
✓	Clean Shift Mag. Valve		X		

Check Here	CHASSIS AND BRAKE INSPECTION	Repairs Made	Adj.	O.K.	Mech
✓	Clutch Pedal Clearance			X	
✓	Clutch for Slipping			X	
✓	Axles, Flanges, and Studs			X	
✓	Tighten All Wheel Lugs			X	
✓	Wheel Bearing Adjustment			X	
✓	Pitman Arm & Drag Link Ends			X	
✓	Springs - Shifted or Broken			X	
✓	Seal Leaks - Hyd. Trans.		X		
✓	Brake Lining Wear		X		
✓	Brake Adjustment		X		
✓	Brake Diaphragms - Br. Applied			X	
✓	Brake Shoe Springs		X		
✓	Air Line Leaks - Brake Applied			X	
✓	Slack Adjusters		X		
✓	Drain Air Tanks		X		
✓	Emer. Door and Buzzer		X		
✓	Shift Governor - Oil			X	
✓	Hand Brake Adjustment		X		
✓	Front & Rear Door Operation		X		
✓	Clean Hyd. Fluid Filter			X	
✓	Destination Sign Operation			X	
			X		

LUBRICATION
(Do Not Over Lubricate)

ENGINE	Work Done	By
Oil Generator, Starter, Dist., Etc.	YES	
Oil All Moving Linkages	YES	
Oil All Control Rods	YES	

CHASSIS	Work Done	By
Grease As Per Chart	YES	
Check Differential Grease Level	YES	
Check Transmission Grease Level	YES	
Check Fluid Level - Hydraulic Trans.	YES	

REPORT OF ADDITIONAL REPAIRS TO BE MADE AT LATER MILEAGE

This is to certify that each item has been checked according to instructions.

Signed E. B. Evans Foreman

MECHANICS USE THESE CARDS during minor inspections, checking 49 items. Similar cards for major inspections list 120.

because we don't want any bus to sit on the lot for lack of a part."

Passenger carrying equipment early this year included 20 TD3609's, ten TD3610's, ten TD4507's and four TD3612's.

No startling savings in money can be shown yet as a result of the first year's inspection program's operation, mainly because a great deal was spent for repairs and equipment and for setting up the system in 1953.

For example, 20 engines were completely rebuilt during the first year of Evans' regime. But, as mentioned before, parts and labor costs are the lowest of the six PCL lines. In January, 1954, maintenance cost per mile was 5.58 cents, which included all garage expenses, even mechanics' coveralls. The figure in March, 1953 was 6.31 cents.

Incidentally, some amazing results have already been realized from Evans' engine rebuilding program. Fuel consumption before rebuilding was 4.9 miles per gallon. Now it's 5.8 mpg with 24 of the 44 engines yet to be worked over.

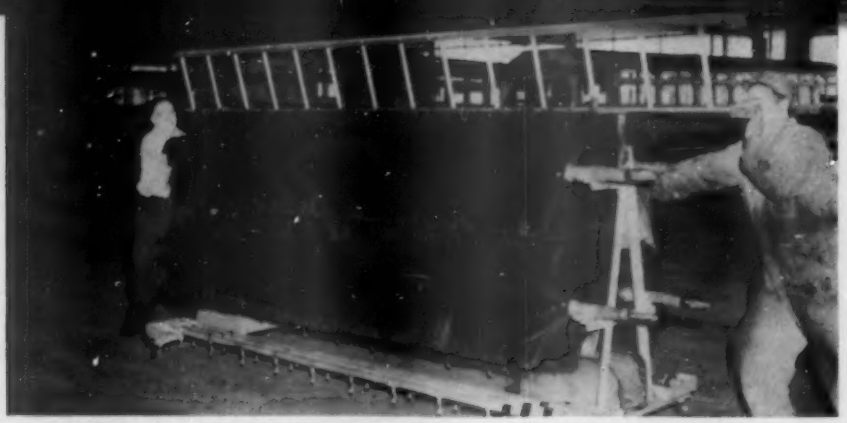
Mileage per quart of lubricating oil was 471 in January, 1954 and the company is shooting for 600. (GMC says diesels normally average 250 mpq, according to Evans.)

One bus ran 3,600 miles in March of the year without adding a drop of oil—not counting changes, of course. To prove that this is no freak, another ran 3,000 without adding, and a third used only two quarts in 3,400 miles.

While figures like these are enough to make a bus man smile, San Jose City Lines feels that by integrating its PM program with effective inspection it has only scratched the surface of potential maintenance savings.

TARGET FOR '54

LOWER MAINTENANCE COSTS



1. **WASHER ASSEMBLY STARTS** as aluminum cart is wheeled out of storage. Cart contains four nylon brushes, six upright sprays, pins to hold guide rails up, two guide rail flanged ends and a ladder. Rigging for washer is hung from ceiling above cart.

Disappearing Bus Washer

A COMPLETELY AUTOMATC BUS WASHER that can be assembled in minutes and disappears when not in use is now in operation at Triboro Coach Corporation's new garage in Queens, N. Y.

Designed and built by Maintenance Superintendent Willie Cicero, it saves valuable floor space . . . and in the average city, where space is at a premium, every square foot must be made to count.

Besides saving space, Triboro's washer also saves time and money. Before it was installed two day men and one night man were kept busy cleaning Triboro's fleet of 130 buses.

Since the machine began operating, one day man is free altogether for other work . . . and the two night men run the entire fleet through the washer on Monday and Tuesday evenings . . . leaving them free to wash down interiors on the other three working evenings.

The washer can be assembled and ready to go in 13 minutes. When the last bus is run through it can be taken down in the same time, leaving the floor space absolutely clear for storage of buses.

Cicero figures that his disappearing washer saves storage space for six buses . . . when you take into account the space normally occupied by a permanent washer and the necessary maneuvering room which must be left open around the washer.

Triboro mechanics made most of the component parts of the washer right in the shop. Counting their labor costs, plus all other expenses, total cost of the washer was two thousand dollars.

And according to its inventor, it does a better, more uniform job of washing than many commercial washers which have the added disadvantage of taking up permanent floor space.

The only parts of the machine which weren't made in the shop are four 20-inch diameter nylon brushes, made especially for Triboro by the Fuller Brush Company at a cost of $165 each.

They're built in separate sections, so that the bottoms, which wear out fastest, can be replaced separately, without the necessity of replacing the entire length of the brush.

Building the washer was no trouble, either.

Shop men assembled the entire machine, with the exception of overhead rigging, which was done by a professional rigging concern.

A 138-gallon tank in the rigging holds the soap mixture, which can be any commercial cleaner.

Twenty-five pounds of tank pressure force the mixture out through small nozzles onto the top and front of the bus being washed.

Rinse water is fed through a three-inch pipe, which doesn't require a booster pump to provide sufficient pressure. Regular city water is used in Triboro's washing operation.

The mechanism is triggered by two ordinary electric switches, actuated by the bus as it moves in and out of the washer.

Cicero toyed with the idea of using electric eyes costing $300 apiece . . . rejected them in favor of the switches at $3 each.

The entire brush assembly is movable, so that as the nylon brushes wear at the edges they can be inched in closer to the bus.

This is accomplished by means of movable plates in the rigging, to which the upper brush terminals are attached.

When the floor plates to which the brush bottoms are removed they reveal Timken bearings, also movable, in which the brushes rotate.

A bolting arrangement keeps upper and lower plates secure at any brush position.

Although the washer runs perfectly now, several improvements are planned in the near future.

Two hose and brush attachments will be added to take care of the front and rear of buses.

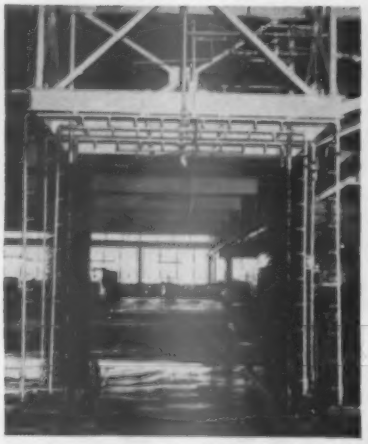
And plans are already under way to drill a well outside the garage, which will protect against city water shortages by providing all water needed for the washing operation.

2. BRUSHES AND UPRIGHT SPRAYS are attached. Brush bottoms fit into Timken bearings under removable floor plates.

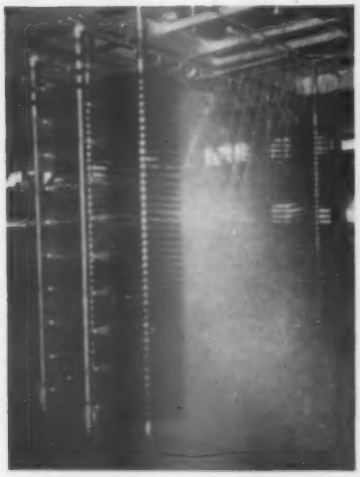
3. GUIDE RAILS, flush with concrete floor, are pulled up and pins inserted to hold rails firmly in position.

4. FLANGED ENDS are attached to rails to help guide buses. Spring shackle pins are hand tightened in threaded bushings.

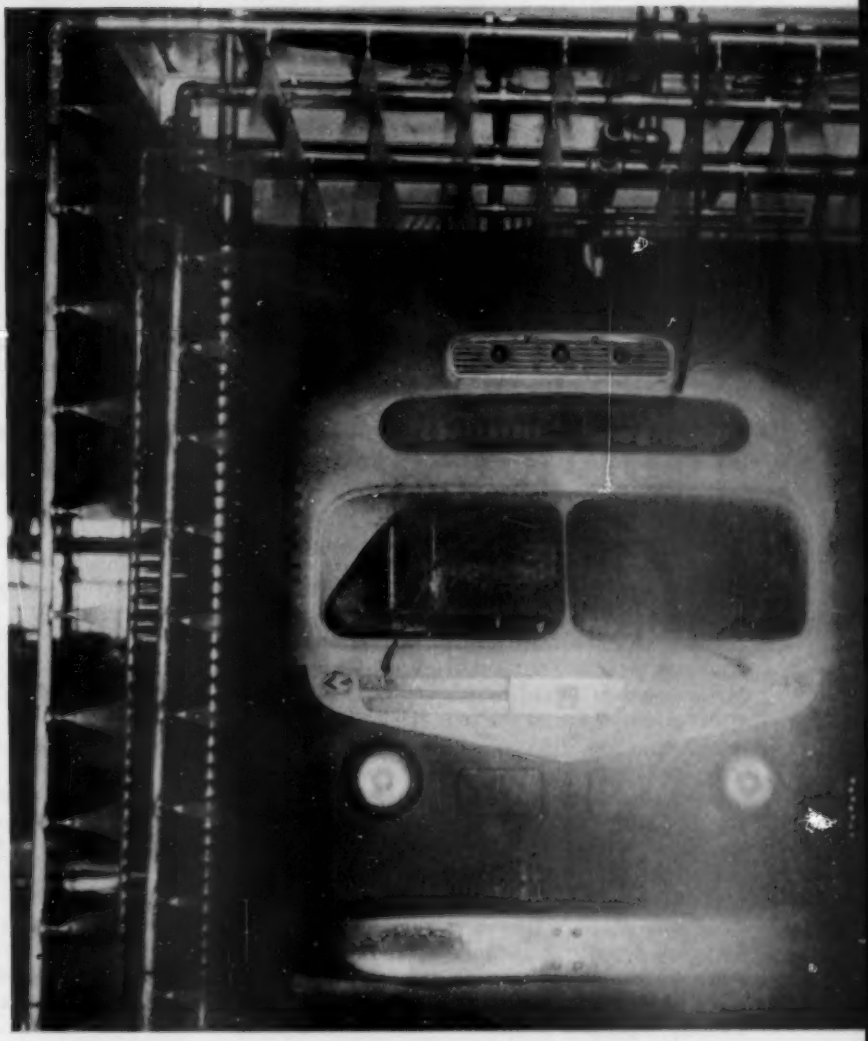
Saves Valuable Shop Space



5. COMPLETELY ASSEMBLED in 13 minutes, washer comes apart in the same time.



6. SEPARATE STRATA on nylon brushes enable replacement of worn sections.



7. WASHER IN ACTION does a fast, thorough job of cleaning Triboro's 130 buses . . . has extra advantage of disappearing completely after use to free garage floor space.

TARGET FOR '54

LOWER MAINTENANCE COSTS

BEFORE Former old ramshackle street car barn on the Indianapolis Transit property was almost useless except for part time storage of motor buses.

Indianapolis Gets 20% Dividend

INDIANAPOLIS TRANSIT SYSTEM is currently enjoying a savings in maintenance cost of approximately $1,000 per week.

This saving has been realized as a result of the expenditure of $250,000 for a shop face-lifting program. The savings are viewed by top management at Indianapolis as a nice fat 20 per cent dividend on the investment.

Savings for the most part are derived from the more effective use of manpower, the elimination of unnecessary operations and the conservation of both time and material.

They are reflected in a reduction of man hours per 1,000 bus miles of from 34.2 in may 1953, when the face-lifting program started, to 28.52 in October 1953, when full benefits of the modernization program plan began to take effect.

Twenty separate projects are embraced in the program. Four involve new construction and the conversion of old buildings, and five involve new paving and two roofing and painting jobs. Nine projects cover the installation of new equipment. Here's the way it breaks down:

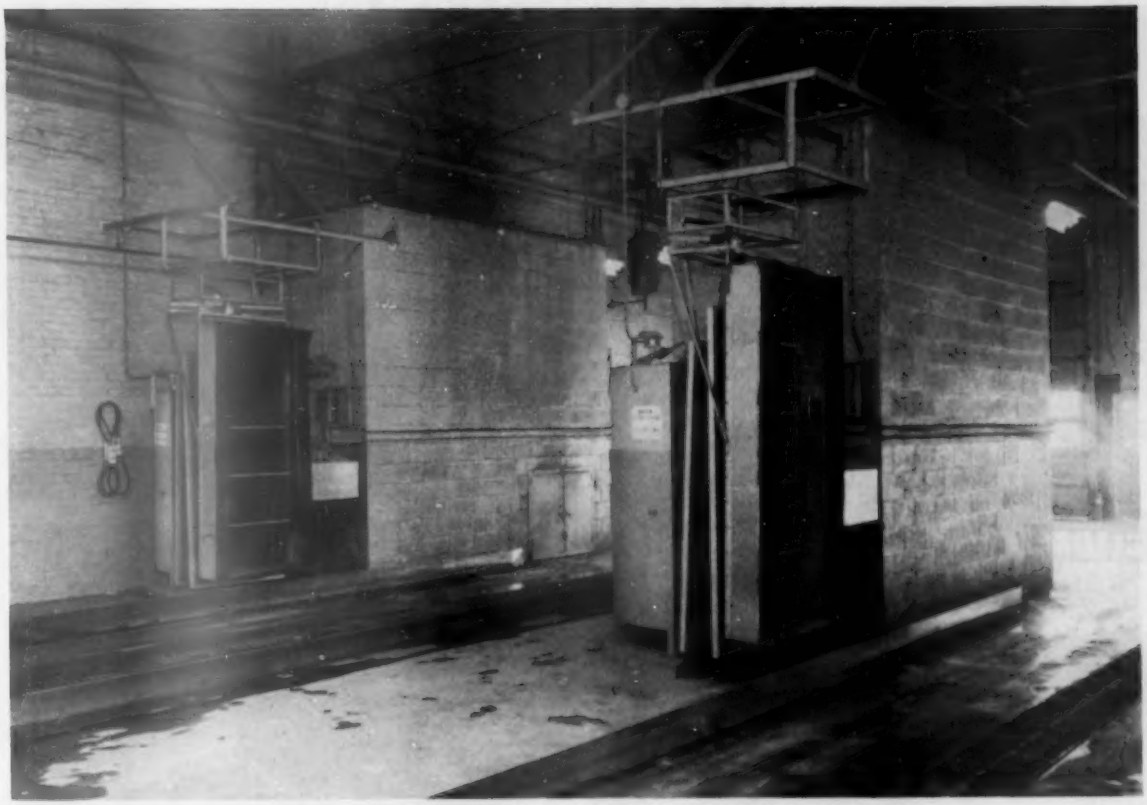
New construction and conversions	$ 85,000
Installation of new equipment	75,000
Paving	78,000
Painting and roofing	12,000
Total cost of shop improvements	$250,000

A case example of how savings are being effected is found in the bus washing and cleaning department.

At a cost of $45,000 for building renovation and the purchase of equipment, an old street car barn was transformed from an almost useless, ramshackle building into an efficient washing and cleaning plant.

Two Jetomatic washers and a pair of Buck Cyclone cleaners were installed. Cost of this equipment and installation was $17,000.

The result: buses never were so spic and span inside and out. Half the fleet is washed each night and interiors of all buses "cycloned" every day.



AFTER The same old barn, now transformed into an efficient washing and cleaning plant. Total of $45,000 was spent on renovations and new equipment, which includes two Buck Cyclone cleaners and two Jetomatic washers.

From Shop Modernization Program

The production rate for washing and cleaning has just about doubled while the thoroughness with which these jobs are done has increased nearly fourfold. These improved facilities permit a force of nine men to fuel, wash, clean and park a fleet of 217 motor buses.

Modernization of storeroom and moving it from the basement of the shop to a central location on the ground floor was another project which cut costs. The pay-off here was three-fold:

1. Reduction of lost motion and wasted footsteps through greater accessibility to all shop departments.
2. Reduction of material rehandling which lessens labor as well as loss and damage to stores.
3. Increased storekeeping efficiency and easier inventory control by replacing ceiling-high shelves with waist-high counters.

New paving was an important part of the rehabilitation program.

While most of the improvements can be measured in terms of actual cash savings, certain items produce intangible benefits which can not be measured easily in dollars and cents.

For example, the main purpose of the $78,000 paving program was to eliminate dust and dirt in the shops and inside the stored buses.

Now, with a smoothly paved yard, dust no longer is a problem. Moreover, the yard now can be used year around and can be snow-plowed if necessary in the wintertime. The effective area of vehicle parking has been increased nearly 100 per cent.

Automatic overhead doors, installed at a cost of $35,000, are credited with a number of tidy savings.

There are 17 of these new doors. They replaced old and drafty swinging double barn doors which often required two men to open and close.

The new automatics snap open or shut in a wink, keeping out morale-chilling winter winds and conserving

Continued on next page

BEFORE Old-fashioned double barn doors were drafty, hard to open and close, caused high fuel bills.

AFTER New automatic overhead doors snap open, snap shut, save fuel and labor, stop drafts.

BEFORE This entrance area to the old street car shops was little used after the advent of buses.

AFTER Same area now houses steam facilities for all parts cleaning, hoist for underchassis cleaning.

fuel. Door damage, a former problem caused by high winds or by doors being hit by buses, now is eliminated.

Steam cleaning, formerly performed at two separate places with double the work and mess, now is concentrated in a single steam cleaning room.

It is in a central location and is one of the most modern cleaning facilities of its kind in the bus industry. Glass enclosed with glazed tile walls, it is ventilated automatically whenever steam apparatus is put to use.

The steam room not only handles all ordinary parts cleaning, but also has hoist facilities to permit the steam cleaning of the bus underchassis prior to the 6,000-mile inspection. This underchassis cleanliness makes for more efficient inspection, and reduces inspection time.

Paint shop investment of $12,000 to convert a former steam cleaning room into a modern painting facility is now paying off in two ways:

1. By cutting vehicle time out of service for painting from two days to one.
2. By accomplishing a better looking and more lasting paint job.

A feature of the new paint shop is a ventilating system capable of supplying 52,000 cubic feet per minute of conditioned air, which is heated in winter.

Fumes and overspray are drawn downward into a pit beneath the floor where filters purify the air before venting it to the atmosphere.

BUS TRANSPORTATION

1954

BUYERS' GUIDE

TARGET FOR '54
LOWER MAINTENANCE COSTS

An authoritative source of "where-to-buy" information on Bus Parts, Materials, Accessories, Shop Equipment and Tools will be found on the following pages.

This Buyers' Guide contains the names of more than 1,600 manufacturers and classifies some 350 products used by bus operators.

[* Manufacturers whose products are described in the advertising pages of this or previous issues during the past year.]

McGRAW-HILL PUBLISHING CO., INC. 330 W. 42nd St., New York 36, N. Y.

VEHICLE, BODY, CHASSIS MANUFACTURERS

Associated Equipment Co., Ltd., Southall, Middlesex, England
Beaver Metropolitan Coaches, Inc., Beaver Falls, Pa.
*Beck & Co., C. D., Sidney, Ohio
*Berliet, 26 Rue de la Pepiniere, Paris 8, France
*Blue Bird Body Co., Fort Valley, Ga.
Carpenter Body Works, Mitchell, Ind., (Bodies)
*Checker Cab Mfg. Co., Kalamazoo, Mich.
Chevrolet Motor, Div. GMC, Detroit, Mich. (Chassis)
Corbitt Co., Henderson, N. C.
Crown Body Coach Corp., Los Angeles 21, Cal. (Bodies)
Dodge Brothers Corp., Detroit, Mich. (Chassis)
*Fitzjohn Coach Co., Muskegon, Mich.
*Flxible Co., Loudonville, Ohio
*G.M.C. Truck & Coach Div., G.M.C., Pontiac, Mich.
Hackney Bros., Inc., Wilson, N. C.
Hicks Body Co., Lebanon, Ind. (Bodies)
Intercontinental Mfg. Co., 1819 Broadway, New York, N. Y.
*International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. (Chassis)
Leyland Motors, Ltd., Lancashire, England
*Mack Mfg. Corp., Empire State Bldg., New York 1, N. Y.
*Marmon-Herrington Co., Indianapolis 7, Ind.
*Metropolitan-Cammell-Weymann Motor Bodies, Ltd., Westminster, England
Oneida Products Corp., Canastota, N. Y.
Pacific Car & Foundry Co., Renton, Wash.
*Pullman Standard Car Mfg. Co., 79 E. Adams St., Chicago, Ill.
Queen City Chevrolet Co., Cincinnati, Ohio
Reo Motors, Inc., Lansing, Mich.
*St. Louis Car Co., St. Louis, Mo.
Shop of Siebert, Inc., Toledo 2, Ohio
*Southern Coach Mfg. Co., Evergreen, Ala.
*Superior Coach Corp., Lima, Ohio
*Transit Buses, Inc., Detroit 27, Mich.
*Twin Coach Co., Kent, Ohio
Union City Body Co., Union City, Ind. (Bodies)
Wayne Works, Richmond, Ind.

ENGINES, MANUFACTURERS of

Air Cooled Motors, Inc., Syracuse, N. Y.
Buda Co., Harvey, Ill.
Chrysler Corp., Industrial Engine Div., Detroit 14, Mich.
*Continental Motors Corp., Muskegon, Mich.
*Cummins Engine Co., Columbus, Ind.
Detroit Diesel Engine Div., General Motors Corp., Detroit 23, Mich.
*Fageol Products Co., Kent, Ohio
*General Motors Truck & Coach Div. General Motors Corp., Pontiac, Mich.
Hall-Scott Motor Car Co., Berkeley, Calif.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee, Wis.
*Hercules Motors Corp., Canton 2, Ohio
*International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

* This Asterisk . . .

. . . Prefixing the name of any manufacturer listed in the Buyers' Guide indicates more complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues of this year.

*LeRoi Co., Milwaukee 4, Wis.
Lycoming Div., Aviation Corp., Williamsport, Pa.
*Mack Mfg., Empire State Bldg., N. Y. C.
*Twin Coach Co., Kent, Ohio
Waukesha Motor Co., Waukesha, Wis.
Wisconsin Motor Corp., Milwaukee, Wis.

AIR CONDITIONING EQUIPMENT (For Buses)

Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Carrier Corp., Syracuse 1, N. Y.
Frigidaire Div. General Motors Corp., Dayton 1, Ohio
Trane Co., La Crosse, Wis.
*Tropic-Aire Inc., 5201 W. 65 St., Chicago 38, Ill.
York Corp., York, Pa.
*Vapor Heating Corp., Railway Exchange, Chicago 4, Ill.

AXLES, MANUFACTURERS of REAR

*Clark Equipment Co., Buchanan, Mich.
Eaton Mfg. Co., Cleveland 10, Ohio
*Spicer Mfg. Div. of Dana Corp., Toledo 1, Ohio
*Timken-Detroit Axle Co., Detroit, Mich.

ACCESSORIES, PARTS AND SUPPLIES

ACETYLENE—See Oxygen and Gas, Compressed

ADVERTISING—See Cards, Car

AIR CLEANERS—See Cleaners, Air

AIR-SPRINGS—See Shock-Absorbers

AMPLIFIERS—Mobile

*Z & W Mach. Prods., Inc., 5100 St. Clair Ave., Cleveland 3, Ohio

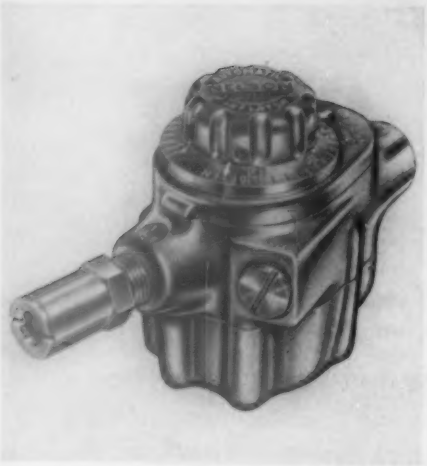
ANTI-FREEZE

Commercial Solvents Corp., 17 E. 42nd St., New York, N. Y.
*du Pont de Nemours & Co., E. I., Wilmington, Del.

Continued on page 126

TARGET FOR '54
LOWER MAINTENANCE COSTS

WHAT'S NEW



New improved automatic tire inflator . . .

. . . features the addition of a built-in screen to keep out dirt and scale, and new non-clogging valve seats.

The new inflator weighs slightly over a pound and attaches directly to any conventional airline, with no installation expense. The operator dials the desired tire pressure and presses the chuck on the valve stem; air flow stops at the pre-set pressure. The inflator is unusually accurate, but may be checked and recalibrated if necessary without removal from airline.

Use of the inflator assures identical pressures in each pair or set of tires checked, eliminating the driving discomfort and uneven tire wear of unbalanced inflation. Two models are available; a passenger-tire model with an automatic inflator range of 15 to 45 lbs., plus an "open" position, and a high-pressure model with a range of 10 to 110 lbs. *Barmotive Products, Inc., 440 Peralta St., San Leandro, Calif.*

New 37-passenger deck and a half bus . . .

. . . has been put into production by the C. D. Beck Company at Sidney, Ohio.

The new silversides coach is 35 feet in overall length . . . seats 29 passengers in the top deck, and eight in the lower desk.

For passenger comfort, Sunshade glass is used throughout, all seats are fully reclining, and the entire coach is completely air conditioned.

The new deck and a half coach is Cummins diesel powered, and features the tandem axle which has been used by Beck for the past five years.

Other features of the coach are its extremely modern exterior and interior design, and its oversize picture windows.

For full details and additional information write to *C. D. Beck and Company, Inc., N. Main Avenue and Russell Road, Sidney, Ohio.*

Improved vertex magneto...

. . . particularly suited for high compression engines is now available. Provides a high voltage output and permits a wider spark gap through increased high-tension output.

The new Vertex operates at a slower starting speed to improve starting and make hand-cranking easier on engines without self-starters. An aluminum nickel magnet replaces the cobalt steel magnet formerly used, and the new Vertex is encased in a brass laminated housing where molded bakelite was used before. The magneto operates at an engine speed of 60 rpm, 30 to 40 rpm slower than formerly. *Ronco Corporation, 1017 Packard Building, Philadelphia, Pa.*

New design in lenses . . .

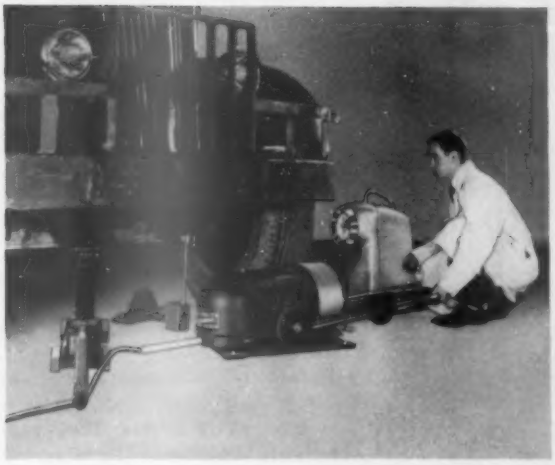
. . .for directional lights has recently been announced. The light includes such features as light weight, ruggedness and longer range of visibility. This is made possible by the use of concentric, prismatic lucite lenses.

Because of the lens design, the lamps can be mounted at any angle and still give maximum light regardless of lens position in the lamp. No reflectors are necessary and only 21-candle power bulb is required. The lamps are made in double face, single face, semi-flush and flush models. The shockproof lamp housings are of corrosion-resistant bonderized steel with black enamel baked on. *J. W. Speaker Corporation, Milwaukee, Wisc.*

Portable air compressors...

. . . in a variety of models are now being introduced. Designed expressly for spray painting is a one horsepower model, rated at 60 lb maximum pressure and delivering 5.4 CFM of air.

For general utility work, ½ and one horsepower compressors, both with 100 lb maximum pressure, are also available. The one horsepower unit delivers 4.2 CFM of air and the ½ horsepower model has an output of 1.91 CFM. All compressors are available with electric or gasoline motors. The compressor and motor are mounted on a chassis which has two large diameter wheels with rubber tires. Air taken into the unit is filtered. *DeVilbiss Co., Toledo, Ohio*

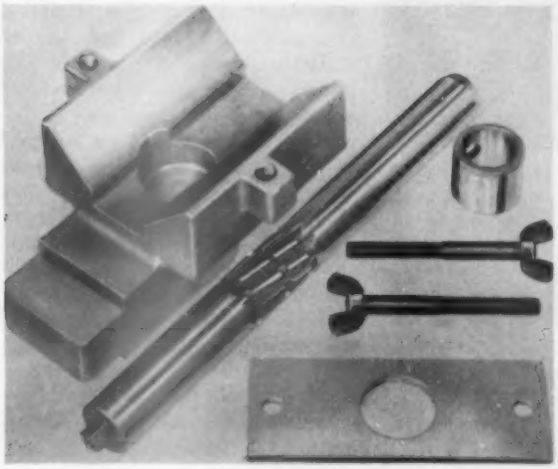


Wheel balancers eliminate time, effort . . .

. . . by balancing vehicle wheels on the vehicle rather than off. The new electronic balancer balances to precision both planes, up and down and side to side motion of the wheel.

Everything that rotates—tires, tube, wheel, hub and brake drum is balanced as a unit, and under all conditions of tire distortion caused by centrifugal force. The basic balancer unit, includes chassis, electronic dual-range meter and strobe light, all mounted in a portable cabinet, plus a vibration pick-up unit with 10 ft. of cord, and 20 ft. of power cord.

In use, the vibration pick-up is placed under the jacked-up vehicle with the magnet touching the axle. The amount of unbalance is relayed by the pick-up through the amplifier and is recorded on the meter, indicating the amount of weight to be applied. *Stewart-Warner Corporation, Alemite div., Chicago, Ill.*



Series of piston bushing reamer sets . . .

. . . for GM diesel engines, designed to remove excess stock from service bushings, according to factory specifications, has recently been announced.

A special set has been developed for each of the following GM diesel engine applications:

- J 4970-A series 51's
- J 3071-A series 71's
- J 5131 for model 6-110's

Each set includes the three tools required to quickly and accurately perform this necessary reaming operation . . . reaming fixture, two stage reamer, and guide bushing. The special reamers insure the proper fit of piston pin to bushing, and the fixture insures alignment of the piston and pin to the connecting rod. Additional information on the set may be obtained by writing to the *Kent-Moore Organization, Inc., 5-105 General Motors Building, Detroit 2, Mich.*

Water rinse cleaner . . .

. . . combining special solvent, detergent and emulsifying agent is now being offered. It has been designed for cleaning fuel tanks which have become coated with scum.

It has also been found very effective for removing oily or greasy deposits from various types of equipment, such as motors, pumps, machinery, etc., provided petrolem solvents or water may be used on them. Paint and decals on such machinery or equipment are unharmed by the use of the cleaner. The cleaner may be applied by spray or sponged on. For additional information on the new cleaner write to the *Sinclair Refining Company, 600 Fifth Avenue, New York City, N. Y.*

Electric crossover . . .

. . . designed so that trolley coach operators can now maintain speed with no danger of dewirement is a recent development.

Results of a two year test show that there is less noise and longer life for shoes and inserts, greater speed, and no dewirements when previously it was usual to have five or six a day. The new crossover has a continuous underrun that allows the collector to travel entirely on the groove. The contactor energizes a coil that moves the runner into the position corresponding to direction of travel. While the present crossovers are all 90 deg, other angles can be supplied. *Ohio Brass Company, Mansfield, Ohio*

Oakite's new cleaner . . .

. . . for use in the transportation industry is now being offered. Known as Compound No. 180, the cleaner has been designed for use in exterior cleaning of buses, truck trailers and trolleys of the new modified TRC stainless steel now being used by several manufacturers.

Used in automotive washing equipment or by manual scrubbing method, this material is reported to provide effective removal of light-to-medium soils with maximum safety to vehicle surfaces.

Additional information on the new cleaner can be obtained by writing to *Oakite Products, Inc., 116C Rector Street, New York.*

Continued on next page

NEW SCHOOL BUS CHASSIS, transit type, has been developed by Marmon-Herrington. It features an exceptionally strong frame of 42 inches width instead of the usual 34 inches to insure maximum stability.

New Chassis Developed For School Bus Use

MARMON-HERRINGTON COMPANY, Indianapolis, Indiana, has announced a new transit-type chassis designed specifically for school bus service.

Known as the Safe-Way, the new chassis was developed in cooperation with such leading school bus body builders as Superior, Wayne, Carpenter, Crown and Ward.

Three chassis lengths are available to accommodate school bus bodies seating 61, 67 and 73-passengers respectively, all on 27 inch seat centers.

Safety and comfort as well as exceptional reliability, were dominant considerations in the development of the new Safe-Way.

For example, the chassis is designed with engine in the rear, placing entrance door and driver well ahead of the front wheels. This gives the driver a clear view of children entering, leaving and passing in front of the bus at all times, materially reducing the accident hazard.

The wide frame is another important safety feature found in the Safe-Way. The exceptionally strong, wide frame spans 42 inches instead of the usual 34 inches.

This, combined with wide-tread axles, insures maximum stability under all driving conditions.

New design in the rear engine of the Safe-Way makes it possible to carry 73-passengers on about the same wheelbase as that for a 55-passenger unit when mounted on a conventional chassis. This substantially reduces over-all length, making the vehicle more maneuverable and safer to operate.

To insure maximum riding comfort, the Safe-Way has springs of the progressive transit-bus type, both front and rear. Springs of this type provide a smooth, level ride, even when the vehicle is empty, yet have plenty of reserve capacity for full loads.

Front axle of the Safe-Way is made of a heavy-drop forged "I" beam type, heat treated and made from chrome manganese steel for long life and safety.

Rear axle is of the full-floating type with single reduction hypoid gearing. Axle housing is of forged carbon steel.

Instead of hydraulic brakes, as found in most school buses, the Safe-Way has full air brakes. These provide faster, smoother, safer stopping.

The electrical system in the Safe-Way is 12-volts with a 50-ampere generator and 17-plate battery rated at 160 amperes at 20-hour rate. This insures adequate electrical capacity for all operating conditions.

Power is provided by a standard Ford 317 cubic inch overhead-valve V-8 engine. One of the most modern of all power plants, this big bore, short-stroke engine develops 165 H.P. at very low piston speeds. Power is transmitted to rear axle by straight-through, 5-speed synchronized Clark transmission.

The coordination of the chassis design and the body designs of the various builders has been so worked out that the combination of the units are much lower in weight than other vehicles of similar capacity.

The new transit-type chassis was introduced at Marmon-Herrington sales meeting held on the 3rd, 4th and 5th of May.

Orders were placed by dealers for initial production run, with first deliveries scheduled for the 1st of July.

Correction

In the April issue of BT we listed in the "What's New" section a new product by the Wilkerson Corporation. We listed the company's address as Englewood, Calif. The correct address is Englewood, Colo.

Engine Tune Up Specifications —

	Bus Make and Model	Engine Make and Model	No. Cylinders — Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At What R.P.M. is Max. H.P. developed?	Compression Ratio	Compression Pressure at Starter Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION														
											Spark Plug and Number	Distributor Make and Number	Spark Plug Make and Number	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Engine Advance-Deg.			Type Advance	Advance Begins at What Engine Deg. and R.P.M.	Advance Ends at What Engine Deg. and R.P.M.		
																	Manual	Centrifugal	Vacuum				Make Valves	Intake Valve Material
1	ACF-Brill C-27	Inter RD 372	6L	4 3/8	4 1/8	140	2850	6.3	116.5d	1-5-3 6-2-4	AC-43 Com ALAN5 CH J6	D 1112357	.028-.032	.022 .022	31 37	5+	—	22	—	A	0°-4° 600 rpm	20°-24° 3400 rpm	TP or WR	31-
2	ACF-Brill C-31	Inter RD 406	6L	4 3/8	4 1/2	149	2750	6.3	120d	1-5-3 6-2-4	AC-43 Com ALAN5 CH J6	D-1112357	.028-.032	.022 .022	31 37	5+	—	22	—	A	0°-4° 600 rpm	20°-24° 1300 rpm	TP or WR	31-
3	ACF-Brill SU-37	Inter RD 450	6L	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	AC-43 Com ALAN5 CH J6	D-1112357	.028-.032	.018-.024	35	5+	—	22	—	A	0°-4° 600 rpm	20°-24° 1300 rpm	TP or WR	31-
4	ACF-Brill C44	Hall-Scott-180-1	6L	5	6	208	2200	6.	116	1-5-3 6-2-4	CH-6	D-1111549	.022	.024-	31 37	10+	30	22	15	A	0°-4° 500 rpm	18°-22° 1300 rpm	HS	31-
5	ACF-Brill IC-41A	Hall-Scott-190-5	6L	5 1/4	6	220	2200	5.6	114	1-5-3 6-2-4	CH-6	D-1111549	.022	.024	31 37	10+	30	22	.15	A	0°-4° 500 rpm	18°-22° 1300 rpm	HS	31-
6	ACF-Brill-IC-41AC	Cummins NH HB-600	6L	5 1/8	6	200	2100	15.5	—	1-5-3 6-2-4- 1-5-3	—	—	—	—	—	19°	—	—	—	—	—	—	TP	CN
7	Beaver B-35-PT, B40-PT	International RD-450	6L	4 3/8	5	162	3000	6.3	110.6	6-2-4	AC-43 JC-11	D-1110167	.028-.032	.019-.024	35	TDC	—	22	°	VA			TP	31-
8	Beaver 31 & 35 PT, & 40 PT	RD Int 450	6L	4 3/8	5	162	3000	6.2	122.5d	1-5-3 6-2-4 1-5-3	CH-J11	D-1112357	.028-.032	.018 .024	35	5+	—	22	—	A	0°-4° 600 rpm	20°-24° 1300 rpm	TP	31-
9	Beck Silverliner	Cummins NHB-600	6L	5 1/4	6	200	2100	15.5	525	6-2-4	—	—	—	—	—	—	—	—	—	—	—	—	TP	S
10	Beck Luxury Liner	Continental R-6536	6L	4 13/16	5 3/8	200	2600	6	128-150	1-5-3 6-2-4	CH-6 Com	D-1112253	.030	.018-.024	—	5+	—	36	—	A			TP	SH
11	Beck-29	Cummins JBS-600	6L	4 1/8	5	150	2500	15.5	110-	1-5-3 6-2-4	—	—	—	—	—	—	—	—	—	—	—	—	TP	S
12	Beck "9000" Mainliner	Inter. RD-450	6L	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	CH J6 AC-44-5	D-1112357 D-	.028 .032	.018 .024	35	5+	—	22	—	A	0°-4° 600	20°-24° 1300	TP	31-
13	Chevrolet-3802 & 4502	Thriftmaster 235	6L	3 9/16	3 15/16	112	3700	7.5	130	1-5-3 6-2-4	AC-44-5 Com	D-1112388	.035	.018	38 45	2 ATC	—	26	20	VA	0° 600	24°-28° 3500	TP	Sil or Ni
14	Chevrolet-6702 & 6802	Loadmaster 235	6L	3 9/16	3 15/16	112	3700	7.5	130	1-5-3 6-2-4	AC-45-5 Com	D-1112388	.035	.018	38 45	2 ATC	—	26	20	VA	0° 600	24°-28° 3500	TP	Sil or Ni
15	Chevrolet-6702 & 6802 Optional Eng.	Jobmaster 361	6L	3 3/4	3 15/16	135	4000	7.17	130	1-6-3 6-2-4	AC-45-6 Com	D-1112392	.035	.018	38 45	5 BTC	—	34	20	VA	0° 550	32°-36° 3600	TP	Sil or Ni
16	Dodge-C-1-FS6	OWN-TS-342	6L	3 1/4	4 5/8	110	3600	7.25	130-145	1-6-3 6-2-4	AL-45-140	AL-4AY 4003-B-1	.035	.020	38° 40°	2°BTC	—	16°	—	A	0° 800	16° 2700	OWN	Sil
17	Dodge-C-1-HS6	OWN-TS-344	6L	3 7/16	4 1/2	120	3600	7.0	130-145	1-5-3 6-2-4	AL-45-165	AL-4AY 4004-C-1	.035	.020	38° 40°	1°BTC	—	20°	—	A	0° 700	29° 2900	OWN	Sil
18	Dodge-C-1-JS6	OWN-TS-346	6L	3 7/16	4.766	123	3600	7.0	130-145	1-5-3 6-2-4	AL-45-165	AL-4AY 4004-C-1	.035	.020	38° 40°	1°BTC 4°	—	20°	—	A	0° 800	29° 2900	OWN	Sil
19	Dodge-G-1-RS8	OWN-VTS-348	8V	3 13/16	3 5/8	153	3600	7.0	125-140	1-8-4-3-6-5-7-2	AL-4CS-175	AL-1DD-4102-1	.035	.015 .018	A	BTDC	—	34°	—	A	0°-700 10°-800	34° 3700	OWN	Sil
20	Fitzjohn 310 & FTG Cityliner	Herc. JXLD	6L	4	4 1/2	131	3000	6.2	125a	1-5-3 6-2-4	AL TTY	D-1111829	.025	.018	35	TDC	—	22	—	A	0-2a 500	18-22a 3000	E	AS
21	Fitzjohn FTG Cityliner	Herc. WXLD	6L	4 1/4	4 3/4	140	2600	6.2	125a	1-5-3 6-2-4	CH J-6	D-1110200	.025	.018	35	TDC	—	22	—	A	0-2a 500	18-22a 3000	E	AS
22	Fitzjohn FTD Cityliner	Herc. DWXLD	6L	4 1/4	5	142	2600	15.5	—	1-5-3 6-2-4	—	—	—	—	—	—	—	—	—	—	0-2a 500		E	51
23	Fitzjohn 635 Super Duraliner	Wauk. 140GK	6L	4 1/2	5 1/2	176	2600	6.2	90h	1-5-3 6-2-4	CH rl-9	O 1111775	.025	.018-.024	35	TDC	—	30	—	A	10-14a	26-30a	TP	52

Engine Tune Up Specifications – 1954

	Car Make and Model	Engine Make and Model	No. Cylinders – Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At What R.P.M. is Max. H.P. developed?	Compression Ratio	Compression Pressure at Stated Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION									VALVE													PIS		
											Spark Plug and Number	Distributor Make and Number	Spark Plug Make and Number	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Engine Advance-Deg.			Type Advance	Advance Begins at What Engine Deg. and R.P.M.	Advance Ends at What Engine Deg. and R.P.M.	Make Valves	Intake Valve Material	Exhaust Valve Material	Intake			Exhaust			Tappet Clearance Intake, In.	Tappet Clearance Exhaust, In.	Tappets Adjusted Hot or Cold	Type Piston Material	No. Compression Rings	No. Oil Rings
																	Manual	Centrifugal	Vacuum							Head Diameter, In.	Stem Diameter, In.	Seat Angle, Deg.	Head Diameter, In.	Stem Diameter, In.	Seat Angle, Deg.						
1	ACF-Brill C-27	Inter RD 372	6L	4 3/8	4 1/8	140	2850	6.3	116.5d	1-5-3 6-2-4	AC-43 Com ALAN 5 CH J6	B 1112357	.028-.032	.022 .022	31 37	5+	...	22	...	A	0°-4° 600 rpm	28°-24° 3400 rpm	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018 .020	Hot	Al	3	1
2	ACF-Brill C-31	Inter RD 406	6L	4 3/8	4 1/2	149	2750	6.3	120d	1-5-3 6-2-4	AC-43 Com ALAN 5 CH J6	D-1112357	.028-.032	.022 .022	31 31	5+	...	22	...	A	0°-4° 600 rpm	28°-24° 1300 rpm	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018 .020	Hot	Al	3	1
3	ACF-Brill SU-37	Inter RD 450	6L	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	AC-43 Com ALAN 5 CH J6	D-1112357	.028-.032	.018-.024	35	5+	...	22	...	A	0°-4° 600 rpm	28°-24° 1300 rpm	TP or WR	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018-.020	.018-.020	Hot	Al	3	1
4	ACF-Brill C44	Hall-Scott-180-I	6L	5	6	208	2200	6.	116	1-5-3 6-2-4	CH-6	D-1111549	.022	.024-.028	31 37	10+	30	22	15	A	0°-4° 500 rpm	18°-22° 1300 rpm	HS	3140	AESW	2 5/8	.4965	30	2 3/8	.5275	45	.022	.022	Cold	Al	1	3
5	ACF-Brill IC-41A	Hall-Scott-190-5	6L	5 1/4	6	220	2200	5.6	114	1-5-3 6-2-4	CH-6	D-1111549	.022	.024	31 37	10+	30	22	.15	A	0°-4° 500 rpm	18°-22° 1300 rpm	HS	3140	AESW	2 5/8	.4965	30	2 3/8	.5275	45	.022	.022	Cold	Al	1	3
6	ACF-Brill-IC 41AC	Cummins NH HB-600	6L	5 1/8	6	200	2100	15.5	.....	1-5-3 6-2-4	.....	.....	.....	.....	.....	19°	...	...	.....	...	...	...	TP	CN	CN	1 3/4	.402	30	1 3/4	.402	30	.014	.027	Hot	Al	3	1
7	Beaver B-35-PT, B40-PT	International RD-450	6L	4 3/8	5	162	3000	6.3	110.6	1-5-3 6-2-4	AC-43 JC-11	D-1110167	.028-.032	.019-.024	35	TDC	...	22	•	VA			TP	3140	Sil	2 1/4	.437	45	1 5/3	.437	45	.015	.018	Hot	Al	3	1
8	Beaver 31 & 35 PT, & 40 PT	RD Int 450	6L	4 3/8	5	162	3000	6.2	122.5d	1-5-3 6-2-4	CH-J11	D-1112357	.028-.032	.018 .024	35	5+	...	22		A	0°-4° 600 rpm	20°-24° 1300 rpm	TP	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018 .020	.018 .020	Hot	Al	3	1
9	Beck Silverliner	Cummins NHB-600	6L	5 1/8	6	200	2100	15.5	525	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	...	...	...	...	...	...	TP	S	S	1 3/4	.403	30	1 3/4	.403	30	.014	.027	Hot	Al	3	1
10	Beck Luxury Liner	Continental R-6536	6L	4 13/16	5 3/8	200	2600	6	120-150	1-5-3 6-2-4	CH-6 Com	D-1112253	.030	.018-.024	...	5+	...	36	...	A			TP	Sd	Alloy	2 1/4	.....	30	1 15/16	.....	44	.020	.020	Hot	Al	4	1
11	Beck-29	Cummins JBS-600	6L	4 1/8	5	150	2500	15.5	110-	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	...	...	...	...	...	...	TP	S	S	1.53	.403	30	1.53	.403	30	.015 .018	.025 .018	140°F	Al	3	1
12	Beck "9000" Mainliner	Inter. RD-450	6L	4 3/8	5	162	2800	6.2	122.5d	1-5-3 6-2-4	CH J6 AC-44-6	D-1112357 D-	.028 .032	.018 .024	35	5+	...	22	...	A	0°-4° 600	20°-24° 1300	TP	3140	XRC	2 1/4	.434	15	1 35/64	.434	44	.018 .020	.018 .020	Hot	Al	3	1
13	Chevrolet-3802 & 4502	Thriftmaster 235	6L	3 9/16	3 15/16	112	3700	7.5	130	1-5-3 6-2-4	AC-44-5 Com	D-1112388	.035	.018	38 45	2 ATC	...	26	20	VA	0° 600	24°-28° 3500	TP	Sil or NICR	Sil	1 7/8	.3413	30	1 1/2	.3394	45	.010	.020	Hot	Al	2	1
14	Chevrolet-6702 & 6802	Loadmaster 235	6L	3 9/16	3 15/16	112	3700	7.5	130	1-5-3 6-2-4	AC-45-5 Com	D-1112388	.035	.018	38 45	2 ATC	...	26	20	VA	0° 600	24°-28° 3500	TP	Sil or NICR	Sil XCR	1 7/8	.3413	30	1 1/2	.3394	45	.010	.020	Hot	Al	2	1
15	Chevrolet-6702 & 6802 Optional Eng.	Jobmaster 361	6L	3 3/4	3 15/16	135	4000	7.17	130	1-6-3 6-2-4	AC-45-6 Com	D-1112392	.035	.018	38 45	5 BTC	...	34	20	VA	0° 550	32°-36° 3000	TP	SH or NICR	Sil XCR	1 7/8	.3413	30	1 1/2	.3394	45	.010	.020	Hot	Al	2	1
16	Dodge-C-1-F56	OWN-TS-342	6L	3 1/4	4 5/8	110	3600	7.25	130-145	1-6-3 6-2-4	AL-45-140	AL-IAY 4003-B-1	.035	.020	38° 40°	2°BTC	...	18°	...	A	0° 800	16° 2700	OWN	Sil	Sil.	1.531	.3405	45	1.407	.3405	45	.010	.014	Hot	Al	2	2
17	Dodge-C-1-H56	OWN-TS-344	6L	3 7/16	4 1/2	120	3600	7.0	130-145	1-5-3 6-2-4	AL-45-165	AL-IAY 4004-C-1	.035	.020	38° 40°	1°BTC	...	20°	...	A	0° 700	20° 2900	OWN	Sil	Sil	1.718	.3405 .3415	45	1.501	.3395 .3405	45	.010	.014	Hot	Al	2	2
18	Dodge-C-1-J56	OWN-TS-346	6L	3 7/16	4.766	123	3600	7.0	130-145	1-5-3 6-2-4	AL-45-165	AL-4AY 4004-C-1	.035	.020	38° 40°	1°BTC 4°	...	20°	...	A	6° 800	20° 2900	OWN	Sil	Sil	1.718	.3405	45	1.501	.433	45	.010	.018	Hot	Al	2	2
19	Dodge-G-1-R58	OWN-VTS-348	8V	3 13/16	3 5/8	153	3600	7.0	125-140	1-8-4-3-6-5-7-2	AL-4GS-175	AL-IBB-4102-I	.035	.015 .018	A	BTDC	...	34°	...	A	0°-700 10°-800	34° 3200	OWN	Sil	Sil SS.	1.812	.3725	45	1.75	.433	45			Hot	Al	2	2
20	Fitzjohn 310 & FTG Citylinr.	Herc. JXLD	6L	4	4 1/2	131	3000	6.2	125a	1-5-3 6-2-4	AL TTY	D-1111829	.025	.018	35	TDC	...	22	...	A	0-2o 500	18-22o 3000	E	AS	AS	1 7/8	.373	30	1 25/32	.373	30	.012	.014	Con	Al	2	2
21	Fitzjohn FTG Citylinr.	Herc. WXLD	6L	4 1/4	4 3/4	140	2800	6.2	125a	1-5-3 6-2-4	CH J-6	D-1110200	.025	.018	35	TDC	...	22	...	A	0-2o 500	18-22o 3000	E	AS	AS	1 7/8	.373	30	1 25/32	.373	30	.012	.016	Cold	Al	2	2
22	Fitzjohn FTD Citylinr.	Herc. DWXLD	6L	4 1/4	5	142	2600	15.5	.....	1-5-3 6-2-4	.....	.....	.....	.....	.....	.....	...	...	...	...	0-2o 500		E	S1	S1	2 1/8	.437	30	1 5/8	.437	30	.016	.016	Cold	Al	3	2
23	Fitzjohn 635 Super Duraliner	Wauk. 140GK	6L	4 1/2	5 1/2	176	2600	6.2	90h	1-5-3 6-2-4	CH H-9	O 1111775	.025	.018-.024	35	TDC	...	30	...	A	10-14o	26-30o	TP	S2	S2	2 1/8	.4355	30	19/16	.4345	45	.014	.026	Cold	Al	3	2

PISTONS					FUEL SYSTEM																									
Type Piston Material	No. Compression Rings	No. Oil Rings	Width Comp. Ring, In.	Width Oil Ring, In.	Carburetor Make and Model	Carburetor Size, In.	Up or Downdraft	Single or Dual Carburetor	Float Level (No. 3)	How is Float Level Measured (No. 4)	Choke Control—Auto or Manual	Make Choke	Make and Model Antipassing Device	Make and Model Fuel Pump	Testing Pump On Engine: Pump Static Pressure Lb. Sq. In. (x)	Testing Pump On Engine: Min. Bleed Pt. per min.(y)	Pump Delivery in Pints — Fuel per Min.	Make and Model Engine-Heat Control Device	Water Capacity Extra Cooling System Gals. Less Heaters and Pipes	Oil Capacity Crankcase, Qts.	Recommended S.A.E. Oil Viscosity, Summer	Recommended S.A.E. Oil Viscosity, Winter	Normal Oil Pressure, Lb.	At What Engine R.P.M.?	Oil Filter Make and Type	
Al	3	1	.0932-.1237	.1865	H-AA-1G	1 1/4 Duplex Special	D	S	1 1/4 H	G	Man	H	NS	AC GP 7919	4-5 1/4	...	2.67	D	8	10-1/2	40-60	30	40-50	1500	D-Cartridge	1
Al	3	1	.0932-.1237	.1865	H-852-FFG	1 1/4 Duplex	D	S	1.340 H	G	Man	H	NS	AC GP 7919	4-5 1/4	...	2.67	D	8	10-1/2	40-60	30	40-50	1500	D-Cartridge	2
Al	3	1	.0932-.1237	.1865	H-852-FFG	1 1/4 Duplex	D	S	1.340 H	G	Man	H	NS	AC 1539513	4-5 1/4	...	2.67	D	8	10-1/2	40-60	30	40-50	1500	D-Cartridge	3
Al	1	3	3/32	1/4-1/8-	Zen-63AM16	2	Up	S	2 1/64-B	G	Auto	Sis	NS	Car P 6033	.....	...	23/4-4	K	20	28	30-40	30	80	2200	Wn	4
Al	1	3	5/32	1/4-1/8-	Zen-63AM16	2	Up	S	1 3/64-B	G	Auto	Sis	NS	AP 2	2	...	2 2/3-4	K	20	28	30-40	30	80	2200	Wn	5
Al	3	1	.150	.244	.....	.....	...	..	.....	...	.....	.....	....	Cu-DD	.....	...	.....	TH	23	40	30	20	30-50	2100	N	6
Al	3	1	.124	.186	Zen-63AM14	1 3/4	Up	S	25-32-B	G	Auto	Ben	NS	AP 3-4	3-4	...	4	K	11	10	50	50	40	1600	M	7
Al	3	1	.0932 .1237	.1865	H-852-FFG	1 1/4	D	S	1.340 H	G	Auto	Sis	NS	AC 1539613	4-5 1/4	...	2.67	D	8	10-1/2	40-60	10W-30	40-50	1500	Cartridge	8
Al	3	1	.1505	.2445	.....	.....	...	..	Closed	...	.....	.....	....	Cu	.....	...	.....	....	8	28	30	10	35-60	2100	N	9
Al	4	1	.186	.249	H-88S-JJSG	2	D	S	15/16-D	G	Man	EC	NS	AP	.....	...	.....	TH	.....	16	40	30	50	2600	M	10
Al	3	1	L .0932	.2445	.....	.....	...	..	.....	...	.....	.....	....	.....	.....	...	.....	TH	7	12	30	10	30-60	2500	M	11
Al	3	1	.0932 .1237	.1865	H-852-FFG	.....	D	S	1.340-H	G	Man	RP	NS	AC	4-5 1/4	1	.....	D	7	10	40	20	40-45	1500	M	12
Al	2	1	.0933	.1863	RP 7004468	1 1/2	D	S	K	G	M	Own	.....	AC-AF	3 1/2-4 1/2	...	.....	TH	17	5	SAE 20 or 20W	10W or 5W	45	1170-1200	AC	13
Al	2	1	.0933	.1863	RP 7004468	1 1/2	D	S	K	G	M	Own	.....	AC-AF	3 1/2-4 1/2	...	.....	TH	18	5	SAE 20 or 20W	10W or 5W	45	1170-1200	AC	14
Al	2	1	.0933	.1863	RP 7005140	1 1/2	D	S	K	G	M	Own	.....	AC-AF	3 1/2-4 1/2	...	.....	TH	17	5	SAE 20 or 20W	10W or 5W	45	1170-1200	AC	15
Al	2	2	3/32	5/32	BB	1 1/2	D	S	B	G	M	Own	.....	AC 1539643	.....	...	.....	.....	3 7/8	5	.....	.....	40	800	.....	16
Al	2	2	.093	5/32	BB	1 1/2	D	S	B	G	M	Own	.....	Car M639-SB	.....	...	.....	.....	4 1/2	5	.....	.....	40	800	.....	17
Al	2	2	.093	5/32	BB	1 1/2	D	S	B	G	M	Own	.....	Car M639-SB	.....	...	.....	.....	5	5	.....	.....	40	800	P 1/2	18
Al	2	2	5/64	3/16	Car.	1 11/16	D	S	B	G	M	Own	.....	Car M840-S	.....	...	.....	.....	7 1/4	8	.....	.....	40-65	.....	P 1/2	19
Al	2	2	3/32 1/8	3/16	Z-63AM14	1 3/4	Up	S	1 3/64B	G	Man	AM	NS	AC 1539420	3 1/2	...	.....	K	.....	9	30	20	26	1600	M	20
Al	2	2	3/32 1/8	1/4	Z-29M14	1 3/4	D	S	15/16C	G	Man	S	NS	SW-110P	3 1/2	...	.....	K	.....	10	30	30	26	1600	M	21
Al	3	2	1/8	3/16	.....	.....	...	..	.....	...	.....	.....	....	BDS	.....	...	.....	K	.....	14	30	20	40	1800	H	22
Al	3	2	1/8	3/16	Z-63AM14	1 3/4	Up	S	1 32/64C	G	Man	An	NS	AC 1001128	3 1/2	...	.....	K	.....	15	40	40	40	2200	M	23

Spark Plug Make
AC–AC Spark Plug
AL–Auto-Lite
CH–Champion

Electrical Equipment Make
AL–Auto-Lite
D–Delco Remy

Valve Make
Chev–Chevrolet
E–Eaton
HS–Hall Scott
R-W–Rich Mfg.
TP–Thompson Products
WR–Wilcox-Rich

Chain Make
Am–American Chain
Ben–Bendix
EC–Electric Controlled
H–Holley
R-P–Ringwald Prod.
Sis–Sisson
S–Solenoid

Cylinder Head Type
I–Valve-in-head
L–Valve-in-block

Carburetor Make
BB–Ball & Ball
Car–Carter
H–Holley
RP–Rochester Products
Zen–Zenith

Engine Heat Control
AS–Automatic Shutter
BB–Bishop & Babcock Thermostat
Cad–Cadillac
D–Dole Thermostat
K–Kaynor Shutter
TH–Thermostat

Degasser Make
Fa–Fagnol
NS–Not Standard

Fuel Pump Make
AC–AC Spark Plug
AP–Autopulse
BE–Bendix Eclipse
Bus–Bosch
Car–Carter
Cu–Cummins
GM–General Motors
SW–Stewart-Warner
F–Electric Pump in Bottom of Fuel Tank

Oil Filter Make
AC–AC Spark Plug
D–DeLuxe
F–Fram
H–Hercules
M–Michiana

Oil Filter Make (Cont'd.)
N–Nugent
P–Purolator
W–W.G.B.
Wn–Winslow

NOTES:

1 – Compression Pressure
a – at 1000 R.P.M.
c – at 250 R.P.M.
d – at 150 R.P.M.
f – at 400 R.P.M.

2 – Timing
Before Top Dead Center

3 – Float Level
B–Below Edge of Bowl
C–Below Finished Surface of Cover
D–Gasket Surface to Edge of Float Gasket
G–Downdraft 5/8-in. Top of Chamber to Float Level bottom of sight hold. Updraft 7/8 in. Below Top Face of Float Chamber.
H–1 1/4 Flange Surface to Bottom of Float
K–1 5/16 Bottom of Float to Cover Finished Surface
L–Machined Surface (No Gasket) to Highest Point on Float Body

4 – Carburetor Float Level
G–Gage
J–Bottom of Airhorn to Bottom of Float. Open and Closed Position.

TYPE ADVANCE
A–AUTOMATIC
VA–VACUUM ACTUATED
C–CENTRIFUGAL
AC–AUTOMATIC CENTRIFUGAL

(x)–This is "dead end" test from pump outlet to gage–engine operated at idle on fuel in carburetor

(y)–Bleed from tee in pump to carburetor line–engine at idle.

Compression Ring:
L–Wedge type One top
.1175/.1180 Two Ctr. .1190/.1195

Materials
Al–Aluminum
AS–Austinetic Steel
CN–Chrome Nickel
MI–Malleable Iron
SCM–Silicon Chrome Molybdenum
Sil–Silchrome
SS–Stellite
S–Steel Not Otherwise Specified
Sta–Stabilite
SOD–Sodium
NICR–Nickel Chrome Steel

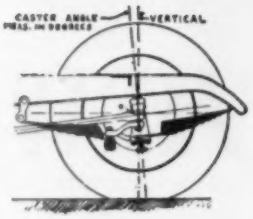
Engine Tune Up Specifications — 1954 ... *continued*

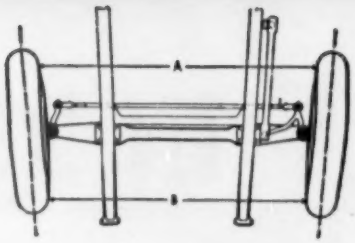
	Bus Make and Model	Engine Make and Model	No. Cylinders – Cylinder Head Type	Bore, In.	Stroke, In.	Maximum Horsepower	At What R.P.M. is Max. H.P. developed?	Compression Ratio	Compression Pressure at Starter Speed, Lb. sq. in. (Note 1)	Engine Firing Order	IGNITION									VALVE													
																	Engine Advance-Deg.							Intake			Exhaust						
											Spark Plug Make and Number	Distributor Make and Number	Spark Plug Gap, In.	Breaker Gap, In.	Cam Angle, Deg.	Engine Timing, Deg. (Note 2)	Manual	Centrifugal	Vacuum	Type Advance	Advance Begins at What Engine Deg. and R.P.M.	Advance Ends at What Engine Deg. and R.P.M.	Main Valves	Intake Valve Material	Exhaust Valve Material	Head Diameter, In.	Stem Diameter, In.	Seat Angle, Deg.	Head Diameter, In.	Stem Diameter, In.	Seat Angle, Deg.	Tappet Clearance Intake, In.	Tappet Clearance Exhaust, In.	Tappets Adjusted Hot or Cold	Type Piston Material	No. Compression Rings
24	Flxible 218F1-54	FTC-180	6	4 1/4	4 3/4	180	2800	7.5	200F	1-5-3-6-2-4	CH	Delco 1110196	.035	.022	35	4C		19		A	800	3000	TP	SS	SS	1 13/16	.373	45	1 11/16	.373	45	.018	.018	Hot	Al	3
25	Flxible 218JBSI-54	Cum. JBS-600	6	4 1/8	5	150	2500	15.1	525	1-5-3-6-2-4																1 3/8			1 3/8			.015	.025	Hot	Al	3
26	Fla-Twin FT-30, FT-32	FTC-180	6L	4 1/4	4 3/4	180	2800	7.5	220F	1-5-3-6-2-4	CH-AL	D-1112304	.035	.018-.024	35	2°		19		A			TP	CN-SS	SCM-SS	1 13/16	.373	45	1 11/16	.373	45	.015	.025	Hot	Al	3
27	Fla-Twin FT-35, FT-40	FTC-200	6L	4 3/8	5	200	2800	7.5	220F	1-5-3-6-2-4	CH-AL	D-1112304	.035	.018-.024	35	2°		19		A			TP	CN-SS	SCM-SS	1 13/16	.373	45	1 11/16	.373	45	.015	.025	Hot	Al	3
28	General Motors	GMC-270	6L	3 25/32	4	125	3400	7.5	120 Min.	1-5-3-6-2-4	AC-44	D-1112305	.028-.032	.018-.024	37	5°		26		A	0°@750 RPH	26°@3200 RPM	E	8640	SIL X10	1 41/64	.341	30	1 7/16	.340	30	.012	.020	Hot	Al	3
29	General Motors	4-71(70)Diesel	4L	4 1/4	5	133	2000	16	370-500	1-2-4-3 or 1-3-4-2													E		SS				1 9/16	.342	30		.009	Hot	MI	4
30	General Motors	6-71(60) Diesel	6L	4 1/4	5	170	2000	16	370-500	1-4-2-6-3-5													E		SS				1 9/16	.342	30		.009	Hot	MI	4
31	General Motors	6-71(70)Diesel	6L	4 1/4	5	200	2000	16	370-500	1-4-2-6-3-5													E		SS				1 9/16	.342	30		.009	Hot	MI	4
32	General Motors	6-71(80)Diesel	6L	4 1/4	5	225	2100	16	370-500	1-4-2-6-3-5													F		SS				1 9/16	.342	30		.009	Hot	MI	4
33	Mack C-41A & C-45A	Mack EN-672	6L	1 7/8	6	187	2000	6.15	108d	1-5-3-6-2-4	CH-7	D-1111541	.035	.020-.022	37	15°		16-1/2	15	VA	0-1@400	13-17@2000		CN	Sta	2 3/64	1/2	30	1 49/64	1/2	45	.010	.020	C. Stat	Al	3
34	Mack C-33, C-37, C-41A, C-45A, C-49	Mack END-673	6L	4 7/8	6	170	2100	16.59	530a	1-5-3-6-2-4						27								Sil		2 1/4	9/16	30	1 11/16	9/16	30°	.011	.022	Hot	Al	3
35	Mack C-33 & C-37	Mack EN-510A	6L	4 7/16	5 1/2	158	2400	6.07	110d	1-5-3-6-2-4	CH-8	D-1111550	.035	.018-.024	37	10°		20	15	VA	0-2@400	18-22@1800		CN	Sta	2 1/32	.4345	30	1 3/4	.4345	45	.010	.020	Hot	Al	3
36	Mack C-50	END 672 Diesel	6L	4 7/8	6	200	2000	13.16	470a	1-5-3-6-2-4													WR	Sil	SOD	2 3/32	.498	45	1 7/8	.498	45	.010	.018	Hot	Al	3
37	Marmon-Herrington	Ford 8M2B	6L	3.5	4.4	104	3000	6.8	120f	1-5-3-6-2-4	CH-H9	Ford	.0255	.024		TDC			16	VA	TDC-475	25BT-DC3000	Ford	Sil	Ford	1.65	.341	45	1.52	.341	45	.009-.011	.013-.015	Cold	Al	2
38	Reo School Bus F-120	Reo-OA-255	6L	3 5/8	4 1/8	107	3400	6.7	120d	1-5-3-6-2-4	CH-J6	D-1112365	.025	.022	37	8				AC	32°@2400	0°@400	E	Sil-XB	S3	2.009-1.999	.435-.434	29½	1.801-1.791	.434-.433	24½	.015	.015	Hot	Al	2
39	Reo School Bus F-120	Reo-OA-292	6L	3 7/8	4 1/8	124	3300	6.55	120d	1-5-3-6-2-4	CH-J6	D-1111812	.025	.022	37	4				AC	30°@2300	0°@500	E	Sil-XB	S4	2.009-1.990	.435-.434	29½	1.801-1.791	.434-.433	24½	.015	.015	Hot	Al	2
40	Reo School Bus F-122	Reo-OA-292	6L	3 7/8	4 1/8	124	3300	6.55	120d	1-5-3-6-2-4	CH-J6	D-1111812	.025	.022	37	4				AC	30°@2300	0°@500	E	Sil-XB	S4	2.009-1.999	.435-.434	29½	1.801-1.791	.434-.433	24½	.015	.015	Hot	Al	2
41	Reo School Bus F-122	Reo-OA-331	6L	4 1/8	4 1/8	140	3200	6.4	120d	1-5-3-6-2-4	CH-J6	D-1111806	.025	.022	37	2				AC	38°@2100	2°@400	E	Sil-XB	S4	2.009-1.999	.435-.434	29½	1.801-1.791	.434-.433	24½	.015	.015	Hot	Al	2
42	Southern Coach S-45HF Propane	FTC 180	6L	4 1/4	4 3/4	180	2800	10	220f	1-5-3-6-2-4	AL-AT-4	D-1112275	.020	.020	35	10°		19		A			TP	SS CN	SS SCM	1 13/16	.373	45	1 11/16	.373	45	.015	.018	Cold	Al	3
43	Southern Coach S-41HF	FTC 180	6L	4 1/4	4 3/4	180	2800	7.5	185c	1-5-3-6-2-4	CH-J5[4]	D-8-75255	.020	.020	35	4°		19		A			TP	SS CN	SS SCM	1 13/16	.373	45	1 11/16	.373	45	.015	.018	Cold	Al	3
44	Southern Coach S-45 DHC	Cummins NHHB 600	6L	5 1/8	6	200	2100	15.5		1-5-3-6-2-4						19°							TP	CN	CN	Two 1 3/4	.405	30	1 3/4	.405	30	.014	.027	Hot	Al	3
45	Southern Coach F-31M, F-35M	Waukesha 6 MZA	6L	4 1/4	4 3/4	130	3000	5.9	110	1-5-3-6-2-4	CH-B Comm	D-1111773	.025	.020	3	5°		35		A			TP	XCR	XCR	1 15/16	.373	45	1 11/16	.372	45	.009	.020	Cold	Al	2
46	Superior SG6106, SG6706-1, SG7306-1	IHCRD450	6L	4 3/8	5	148	2600	6.2	122.5	1-5-3-6-2-4	CH-J6	P-1112357	.028-.032	.018-.024	35	5		28		A	500	3000	TP WR	3140	Sil	2 1/4	.434	15	1.55	.434	45	.018 .020	.018 .020	Hot	Al	3
47	Superior SG6706-L, SG7306-L	Lorch-H540	8L	4 1/2	4 1/4	207	3000	6.7	125	1-8-7-3-6-5-4-2	CH-J8	P-1110616	.025	.016	26	5		33		AC			TP	SS	SS	1 15/16	3/8	45	1.5	3/8	45	.013	.013	Hot	Al	3
48	Transit Buses 328	Cont. K-6330	6L	4	4 3/8	145	2600	6.5		1-5-3-6-2-4	CH-J8	D-112291	.025-.030	.020		8°-BTC		35		C			TP	SS	SS	1 63/64	.435	15	1 41/64	.432	44	.020	.024	Hot	Al	3
49	Transit Buses 332	Cont. K-6330	6L	4	4 3/8	145	2600	6.5		1-5-3-6-2-4	CH-J8	D-112291	.025-.030	.020		8°-BTC		35		C			TP	SS	SS	1 63/64	.435	15	1 41/64	.432	44	.020	.024	Hot	Al	3
50	Transit Buses 340	Lorel H540	8V	4 1/2	4 1/4	200	2600	6.7	125-140	1-8-7-3-6-5-4-2	CH-J8	D-1110823	.025-.030	.018	30	5°-BTC		30		C				SS	SS	1 15/16	.373	30	1 1/2	.372	45	.013	.013	Hot	Al	2
51	White 1144-D, 1150-D	Cummins NHHB-600	6L	5 1/8	6	200	2100	15.5		1-5-3-6-2-4						19°							TP	CN	CN	Two 1 3/4	.405	30	1 3/4	.405	30	.016	.027	Hot	Al	3
52	White 1136, 1136-S	White 280-TA	6L	4 5/8	5	175	2800	6.5	150a	1-5-3-6-2-4	CH-6	D-1111799	.025	.024	35	5		18		A			TP-WR	CN	Sodium Sil-SS	2.3	.43	45	1/8	.43	45				Al	3
53	White 1144 & 1144-S	White 24-A	12L	4 1/8	4 1/4	210	2800	6.0	138a	1-5-3-6-2-4	CH-6	D-1111551	.025	.015	15	5		24		A			TP-WR	CN	Sodium Sil-SS	1.8	.40	30	1.7	.43	45				Al	3

| | PISTONS | | | | | FUEL SYSTEM | | | | |

CASTER

Caster angle measured in degrees.



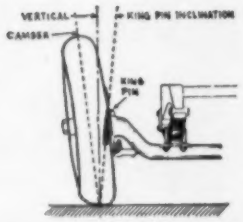


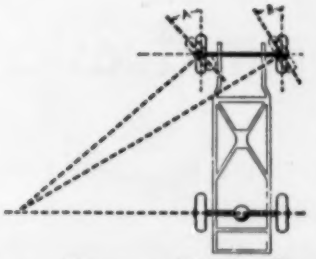
TOE-IN

Measure difference between "A" and "B" in inches.

KING-PIN CAMBER and INCLINATION

Camber angle measured in degrees.





TURNING RADIUS

Measure angle "B" in degrees when angle "A" is 20 degrees.

1954 Motor and Trolley Bus Front End Specifications

	MOTOR BUS MAKE	MODEL	YEAR	Caster Angle in Degrees		Toe-in in Inches		Camber Angle in Degrees		King-pin Angle in Degrees		Turning Radius in Degrees	
				°Max.	°Min.	Max.	Min.	°Max.	°Min.	°Max.	°Min.	°Max.	°Min.
1	ACF-Brill	IC-41A	1953	2	1	1/16	0	1	1	5½	5½	18°24′	
2	ACF-Brill	SU-37	1953	2	1	1/16	0	1	1	5½	5½	16°47′	
3	ACF-Brill	C-27	1948-53	1½	1½	1/16	0	1	1	8½	8½	17 5/12	17 5/12
4	ACF-Brill	C-31	1949-53	1½	1½	1/16	0	1	1	8½	8½	17 5/6	17 5/6
5	ACF-Brill	C-44	1951-53	1¼	¾	1/8	1/8	1	1	5½	5½	18 1/3	18 1/3
6	Beaver	B-35 PT	1951-54	2	0	3/32	1/16	1	1	5½	5½	20	18
7	Beaver	B-31 PT & B-27 PT	1949-54	2	0	3/32	1/16	1	1	8½	8½	20	18½
8	Beaver	B-40 PT	1954	2	0	3/32	1/16	1	1	5½	5½	20	18
9	C.D. Beck	Beck-29	1954	2	1	1/8	1/16	1	1	8	8	–	–
10	C.D. Beck	"9000" Mainliner	1954	3	2	1/8	1/16	1	1	5½	5½	–	–
11	Chevrolet	3802	1954	1°45′	0°45′	1/4	1/16	1°30′	0°30′	8°10′	6°10′	17°45′	–
12	Chevrolet	4502	1954	1°15′	0°15′	1/4	1/16	1°30′	0°30′	8°10′	6°10′	18°	–
13	Chevrolet	6702	1954	1°15′	0°15′	1/4	1/16	1°30′	0°30′	8°10′	6°10′	18°20′	–
14	Chevrolet	6802	1954	1°15′	0°15′	1/4	1/16	1°30′	0°30′	8°10′	6°10′	18°25′	–
15	Dodge-C-I-FS6	C-I-FS6	1954	2°	1°30′	1/8	0	2	2	7°		39°	–
16	Dodge-C-I-HS6	C-I-HS6	1954	2°	1°	1/8	0	2		7°		39°	–
17	Dodge-C-I-JS6	C-I-JS6	1954	2°	1°15′	1/8	0	2		7°		39°	–
18	Dodge-C-I-RS8	C-I-RS8	1954	3°45′	2°45′	1/8	0	1		8°		39°	–
19	Fitzjohn	310 Cityliner	1944-54	2	1½	1/8	1/16	1	0	8	–	18¼	–
20	Fitzjohn	FTG & FTD Cityliner	1950-54	2	1½	1/8	1/16	1	0	5½	–	18¾	–
21	Fixible	218B1-54, 218B6-54, 218B7-54, 218F1-54, 218F6-54, 218F7-54, 218JBS1-54 & 182B1-53	1950-54	2	2	1/8	1/16	1	1	5½	5½	18	17 14/15
22	Fixible-Twin	FT-30, FT-33, FT-35, FT-40,	1953-4	1 ¾	1¼	+1/16	0	1	1	5½	5½	18	17
23	GMC	TGH 3102	1954	½	–	1/8	1/16	1	–	8½	–	17 4/5	–
24	GMC	TDH 3714	1954	3	–	1/8	1/16	1	–	8	–	17 7/10	–
25	GMC	TDH 4514, TDH-TDM 4512, 4515	1954	3	–	1/8	1/16	1	–	8	–	17 4/5	–
26	GMC	TDH, TDM 5105	1954	3	–	1/8	1/16	1	–	8	–	18 1/10	–
27	GMC	TDH, TDM 5106, 5108	1954	3	–	1/8	1/16	1	–	8	–	18 1/5	
28	GMC	PD 4104	1954	3	–	1/8	1/16	1	–	8	–	17 3/5	
29	Mack	C 49	1950-54	3½	2½	1/16	0	1	1	7	7	18¾	18¼
30	Mack	C-33 & C-37D	1947-54	3½	2½	1/16	0	1	1	7	7	19	18
31	Mack	C-41A & C-45A	1947-54	3½	2½	1/16	0	1	1	7	7	17 5/8	17 5/8
32	Marmon Herrington	8 MB	1950-54	3¼°	2½	3/16	1/16	**1	**½	8	8	18	17½
33	Marmon Herrington	8 M2B	1950-54	3¼	2½	3/16	1/16	**1	½	8	8	18	17½
34	Reo	F-120&F-122 with 31104 or 32500 Front Axle	1953-54	2	2	1/8	0	1	1	8	8		
35	Reo	F-120 & F-122 with FD 900 Front Axle	1953-54	2	2	1/8	0	1	1	8	8		
36	Southern Coach	S-45HF	1954	3½	1	3/16	1/16	1	1	5½	5½		
37	Southern Coach	S-41 HF & S-45 DHC	1953-54	3½	1	3/16	1/16	1	1	5½	5½		
38	Southern Coach	F-31 M & F-35 M	1947-54	3½	1	3/16	1/16	1	1	5½	5½		
39	Superior Coach	SG-6106, SG-6706-I, SG-6706-L, SG-7306-I, & SG-7306-L	1954	2	1½	1/8	1/16	1		5½		20	18½
40	Transit Buses	328	1954	3	3	1/8	1/16	1	1	8½	8½	17¼	17¼
41	Transit Buses	332	1954	3	3	1/8	1/16	1	1	8½	8½	17⅞	17⅞
42	Transit Buses	340	1954	3	3	1/8	1/16	1	1	5	5	18¼	18¼
43	White	1144-D	1953	1½		1/8		1		5½		13***	
44	White	1136, 1136-S, 1140, 1140S, 1144 & 1144S	1950-53	1 5/6	•	1/8	•	1	•	8½	•	128½	
45	White	1150-OW	1953	1½	–	1/8	–	1	–	5½	–	18¼	
	TROLLEY BUS												
46	ACF-Brill	TC-46 & TC-48	1950-53	1¾	1¾	1/8	1/8	1	1	5½	5½	18 4/15	18 4/15
47	Marmon Herrington	TC-44 & TC-48	1950-54	1½	1½	3/16	1/16						
48	Marmon Herrington	TC-50	1954	1¼	1¼	3/16	1/16	1	1	5½	5½	18	18
49	Pullman-Standard	P-S 700	1954	2 1/6	2 1/6	1/8	1/8	1	1	5½	5½	18 2/3	18 2/3
50	St. Louis Car Co.	TC-44 & 48	1951-54	1	¾	1/8	1/16	1	¾	5½	•	35 ¾ ***	•

° – No information ‡ – Based on Angle "A" of 40 Degrees. + – Toe-Out *** – Based on angle "A" of 45°. ** – Camber of each wheel just be within 1/2° of each other.

INDUSTRY IN REVIEW

Three Committees Study Bus Finances

New York companies are caught in a vise

• When New York State bus men heard Governor Thomas Dewey promise a complete study of financial conditions last year they took heart. They felt that finally the state intended to do something to cut the tax burden New York operators carry (Sometimes as high as 11 per cent of gross receipts).

After months of waiting, the special five-man committee made public its findings in an interim report. And what it had to say came as a surprise to very few.

New York State bus firms are caught in a vise. The jaws of rising costs and declining riding are slowly forcing more and more bus companies out of business. And to add to their miseries, operators are losing money to congestion and discriminatory franchise taxes.

It's the same story heard throughout the country, but New York's high tax rate gives added meaning. Bus companies must have relief or they'll die an economic death.

Perhaps the greatest single blessing to come from the report is the fact that it comes from an outside source. It's not the bus operators talking this time, it's Governor Dewey's own hand-picked committee.

Originally scheduled for release before the close of the State Legislature, the report was just released recently—about a month past the deadline. Dewey, who had the report in his hands, said it raised related questions; thus the delay.

The five-man group, headed by Public Service Commissioner Glen Bedenkapp, told the governor that no one solution could cure the ills of a sick industry. The complexity of the industry, its problems and government at the various levels that work with transit make a single solution impossible.

One suggestion made by the committee was for competent and efficient management as the most "powerful curative upon which a sickly private enterprise must rely for restoration of its health."

The fact is that companies which boast enlightened management are dying on the vine along with others not as well handled. So the answer can't be entirely there.

Another recommendation was that state and local governments take another look at the impact present taxes have on private operators. And such a look should be complete and impartial, according to the committee. Anything less and government would only be fooling itself.

Should things continue as in the past—fewer riders, no tax relief—government may find itself in the bus business. That's something, the committee says, which should be avoided at all cost.

Most of this is not new to smart bus operators in the state, but the fact that a disinterested third party has brought it out at the request of the governor has given them a new hope.

The squeeze is on in Washington, too

• In Washington, D. C., another kind of squeeze was on. The pressure was on Louis Wolfson, who with his associates controls Capital Transit Co.

Wolfson and his team were the object of a Senate subcommittee investigation, started after a report (Landis report) on alleged financial manipulations. In a 76-page report on its findings, the subcommittee found: "Nothing illegal . . . in the operation of Capital Transit Co."

But that doesn't mean that the subcommittee had nothing to say about the company's operations. It was loud and long in its criticism of the way in which the company is being run, but rejected the idea of public ownership as "not necessary or desirable."

Among other things, the committee recommended that:

• CTC consolidate its scheduling and traffic department staffs.

• CTC show sound financial procedures before using working capital for other purposes.

• PUC be given power to regulate dividends of local utilities.

Added to this partial list were other recommendations covering accounting procedures, PUC changes and a shakeup of CTC's board of directors.

Meanwhile, a U. S. Court of Appeals has given Wolfson the green light on plans to redeem $3.9 million in four per cent bonds that don't mature until 1964. At the same time, the court ordered that a 40-cent dividend declared by CTC in February be held up until the District PUC completes its own study of the company's finances.

Wisconsin's under pressure

• Last month another committee swung into action. This time it was a five-man hand-picked transit commission in Wisconsin.

Chosen by Wisconsin's Governor Walter Kohler, the commission will hear in order transit operators, city officials and state business organizations. When it's all over, Kohler hopes the group will:

• Suggest remedial legislation.

• Suggest improvement in state administrative action.

• Suggest steps communities might take to help themselves.

Bright Future Seen By Roads Congress

• THE FIFTH Highway Transportation Congress met in Washington last month in an atmosphere of general enthusiasm. Highway men from all over the country got together to review progress, discuss common problems and look at prospects for the future.

The meeting was highlighted by the inauguration of the Golden Milestone Awards to be presented to state highway departments for outstanding achievement in awakening public interest in the nation's highways through improved program reports.

Clem D. Johnson, chairman of Project Adequate Roads and newly-elected president of the U. S. Chamber of Commerce, pointed out that the burgeoning automotive population is complicating the road picture faster than it is being straightened out. But he predicted a brightening of the highway picture because of growing public awareness and the fact that highway costs have begun to turn down from the high level they have reached in recent years.

Albert Bradley, National Highway User Conference chairman, keynoted the Congress with a review of road financing problems. He toted up a number of encouraging items on the credit side of the ledger, such as the increase of long-range planning, legislative action on financing by long-term bond and a declining construction cost index.

Bradley pointed up the fact that good roads save users money in lower operating costs in estimating that highway inadequacies cost us about $3 billion a year.

Congestion and its cost to cities were also much discussed. Solutions for moving vehicles faster ranged from suggestions for more expressways to greater use of modern traffic procedures on existing streets. On hand to describe what could be done in the latter field was Henry Barnes, Baltimore traffic chief.

Change in ICC Application Rules Means Extra Care by Operators

• INTERSTATE BUS OPERATORS will have to keep an eye on their competition from now on. On June 1 a new method of filing ICC applications went into effect . . . bus companies will no longer receive notice from operators seeking certificates, permits or licenses.

Under the new set-up a summary of the application, prepared by the ICC, will be published in the Federal Register and copies will be sent only to governors, state boards and district directors of the Commission's Bureau of Motor Carriers, as presently required.

Interested bus companies will have to get the information from the Federal Register instead of from the competing carriers themselves. Those who don't already receive the register, will have to subscribe to keep up with developments.

Subscriptions to the Register, which is published daily, may be obtained by writing the Government Printing Office in Washington, D. C.

One group, the Pennsylvania Bus Association, has instituted a "Watchdog Service" to make sure its members are informed. Its executive committee is studying a proposal that PBA subscribe to the Register and send to interested members the summaries of all ICC applications involving bus operators in the state.

In addition to sending out a weekly summary, the Association would send out a special bulletin, keeping members posted on requests for temporary authority. Such bulletins would go out as soon as the Association picked up the information in the daily copy of the Register.

Key's Lessor Forms New Company To Escape California Regulation

• IN A MOVE DESIGNED to avoid state control of its operations, Railway Equipment & Realty Co. has asked the California Public Utilities Commission for permission to transfer its holdings (buses, trains and other property) to a new firm recently incorporated in California, Bay Area Public Service Corp.

The new firm, wholly owned by RE&R, would lease buses, trains, and other facilities to Key System Transit Lines, Oakland, Calif., as RE&R does now.

RE&R is fighting a California State Supreme Court decision which declares the company a public utility, subject to state regulation. The court ruled income of RE&R and Key System, its wholly owned subsidiary, would be considered together in fixing Key's rates.

RE&R has asked the supreme court to review its decision. The company claims it can not operate as a public utility in California since it is a Delaware corporation. Unless the decision is reversed RE&R faces two alternatives: become a California corporation or sell its holdings.

Under the new setup RE&R would act solely as a holding company. Its equipment, with a book value of $6,670,840, would go to Bay Area Public Service Corp. In return RE&R would get 57,000 shares of BAPS capital stock, $1 par value. BAPS, managed by the same officers as the Key System, is authorized to issue 100,000 shares.

Charleston Tests Tax Ruling

• CHARLESTON (W. VA.) TRANSIT CO. will test in court a ruling by the attorney general that bus firms operating wholly within a city are liable for state vehicle taxes. A 1951 statute says they're not, but the ruling says the regulation is unconstitutional.

The 1951 law is invalid in two ways, according to the attorney general: It doesn't live up to the constitution which states that all motor vehicle taxes must go for road purposes; few operators stay within a three-mile radius of the city. The latter was one of the law's stipulations in exempting transit from certain taxes.

The city and the West Virginia Bus Association are expected to file with CTC as interested parties. If the bus company loses, the court could order it to pay back fees. In that case, Charleston Transit might start suit to recover taxes it paid the city. In any event, an appeal to a higher court could be made by either side.

Niagara Seeks an Exemption

• NIAGARA FRONTIER TRANSIT CO. has asked the Buffalo Common Council to exempt it from a proposed motor vehicle tax which, President Roswell F. Thoma says, would be "unfair duplication" and which would affect fares and service adversely.

NFT already pays a three per cent franchise tax on gross receipts and a one per cent public utilities tax. The two cost NFT $482,917 last year.

Niagara Frontier has also petitioned the council for permission to operate buses 40 feet long. State legislation last year made such vehicles lawful if given local sanction. With a green light, NFT can go ahead with its plans to buy 60 such buses at a cost of $1,250,000.

Meanwhile, NFT is experimenting with seat shifting on present buses. It hopes to give standees more aisle space . . . wants riders to use side doors, although fewer passengers will be carried.

Texas Co. Has New Gasoline

• A NEW DEVELOPMENT in premium gasoline backed by 20 years of research and climaxed by a million-dollar testing program was announced recently by Augustus C. Long, president of the Texas Co. He described the fuel as the first to develop maximum engine power while actually reducing engine wear.

The new gasoline was given road and lab tests equivalent to 1,850,000 miles of driving. These proved, according to Long, that the new gasoline can extend the life of the average engine by as much as 60 per cent.

The new fuel incorporates an exclusive petroleum compound known as "Petrox."

In road tests, a fleet of 26 new cars were driven more than 700,000 miles. They showed 45 per cent less ring wear, 38 per cent less intake deposits and improvement in valve performance up to 300 per cent. Tests were made with other premium gasolines, including Texaco.

Industry Briefs

Whole Vs. Part • Experienced bus men dimmed New York Transit Authority hopes that it could sell its bus lines in a single block to private operators. Drawbacks to such a sale, they said, are monthly losses of $180,000 in Staten Island and natural borough divisions between other bus lines now operated by the Authority.

Elected • E. E. Furry, president and general manager of the Indiana Motor Bus Co., Plymouth, Ind., was elected to the presidency of the Indiana Bus Association at its 20th annual convention attended by over 160.

Dividends • There'll be no dividends on common stock unless they come out of earnings, stockholders of the Portland Transit Co. were told by President Fred Stevenot. He said management wouldn't "undermine property values of stockholders by raiding . . . working capital for false dividends."

Market • Bogota, Columbia, will add 50 new buses to its fleet of 140 gasoline buses and 20 trolley buses, the former partly Mack and partly White. Registered American and European firms will receive bid specifications from the South American city in about three months.

Settlement • After 11 days on strike, drivers for Community Traction Co. returned to their jobs—21 cents an hour richer and working a shorter week. To help pay the award, CTC was given a one-cent increase as of May 22 . . . may get a new rate schedule allowing it to collect up to 20 cents next year if deficits continue. Cash fare with the increase is 16 cents.

Replacement • Economy and flexibility are prompting conversion to lightweight diesel buses in London. They'll take the place of a large part of the city's trolley bus fleet. The shift to diesels will start in about three years and is expected to involve some 1,600 vehicles.

Earnings • Enough income to cover six per cent interest on consolidated mortgage bonds has been reported for the first quarter by the Philadelphia Transportation Co. The reason for the upsurge in earnings: beneficial effects of a January fare increase. The bonds pay three per cent steadily . . . another three if the money is earned.

Birthday • Tung-Sol Electric, specialists in transportation's electric needs, marked 50 years of pioneering in the lamp and electron tube field last month with a dinner attended by some 300 of their friends.

Calendar of Events

A list of activities of interest to the bus industry

June

16-17 North Carolina Bus Assn., Inc.
Barringer Hotel
Charlotte, N. C.

17-19 Michigan Motor Bus Assn.
Park Place Hotel
Traverse City, Mich.

20-22 Pennsylvania Bus Assn.
Bedford Springs Hotel
Bedford, Pa.

24 New England Transit Club
Annual Outing
York Harbor, Maine

July

9-10 N. Y. State Motorbus Assn.
Whiteface Inn
Lake Placid, N. Y.

September

14-16 National Association of Motor Bus Operators
Drake Hotel, Chicago, Ill.

23-25 Automotive Parts Rebuilders Convention
Morrison Hotel
Chicago, Ill.

27-30 American Transit Assn.
William Penn Hotel
Pittsburgh, Pa.

November

8-10 Canadian Good Roads Assn.
Royal York Hotel
Toronto, Can.

Association Index

In the annual index of national and state associations published in the March issue, the following association was inadvertently left out.

• **ASSOCIATION OF TRANSIT EQUIPMENT MEN OF THE MIDDLE ATLANTIC STATES, 69th St. Terminal, Upper Darby, Pa.**

Organized May 16, 1928. President, Chester Osborne, Philadelphia Suburban Transportation Co.; Vice President, A. E. Savage, Capital Transit Co.; Secretary, William H. Powelson, Southern Pennsylvania Bus Co.

Pacific 'Hound Seeks to Divorce Commuter Runs from Long Haul

• PACIFIC GREYHOUND LINES is setting up plans for a subsidiary which would divorce unprofitable commuter lines from regular routes. The subsidiary—to be called Golden Gate Transit Lines—is opposed by the California Public Utilities Commission, Bay Area commuters and by PGL's union.

Greyhound is bypassing the PUC which said the transfer would create confusion in fixing rates and would not be in the interest of the public. This time PGL is going to the ICC for approval.

Two commuter clubs having an interest appeared at recent ICC hearings along with representatives of the union to challenge the financial structure of the proposed subsidiary. They claimed it would be a financial flop.

In reply, M. C. Frailey, Greyhound VP, assured them that PGL doesn't intend to abandon the subsidiary; it is ready to put $150,000 on the line to get the company started.

The proposal to separate commuter runs from long-haul operations has won the support of West Coast transit consultant Marmion Mills. Mills testified at the hearings that the subsidiary would benefit local service and could be combined with future rapid transit.

In a move designed to show good faith, Pacific Greyhound has selected Mills for the job of picking key personnel for the new company.

Meanwhile, PGL revealed its proposed rate schedule during the ICC hearings. About $254,000 would be needed for Marin County alone, the company said. Marin is one of several counties served by PGL runs.

Rate increases would range from 50 to 170 per cent of present schedules and would depend on the number of trips individual commuters made each calendar month.

Should the ICC give its approval to the subsidiary, the state PUC has declared it will not recognize it. Its refusal could mean only one thing: a court fight.

PGL's union is opposed to the new firm on the grounds that members would be deprived of their contract benefits. The argument was dismissed by Frailey, who said, "This should not have been an issue. The employees will have all the privileges they now have."

New England Club Elects Waters President

Leland L. Waters, general manager of the Boston, Worcester and New York Street Railway and new president of the New England Transit Club, is flanked by bus brass at the head table during NETC's recent annual meeting. Pictured are, left to right, Henry G. Bowen, Fitchburg and Leominster St. Ry.; Paul M. Fitzsimmons, Mass. DPU; Waters; John Moran, Metropolitan Transit Authority (Boston); Walter Draper, Cincinnati Transit and Edward Dana, MTA. More than 750 attended the affair at Boston's Hotel Statler.

FROM CAPITAL TRANSIT AND NEW YORK'S TA are, l. to r., Al Savage of CTC, Hy Feldman, ex-CTC man now with TA, and Jack Belsky and Col. James Edmunds of TA.

TALKING OVER MUTUAL PROBLEMS at the meeting are Thomas O'Connor of Chicago Transit Authority and Donald C. Hyde, top man of the Cleveland Transit System.

THE ELECTRICAL DIVISION was well represented, with members discussing everything from accounting methods to the comparative costs of all types of fuel.

LEONARD SAMWORTH of Ohio Valley Bus Company in West Virginia ran the Small Operations meeting. Here he's drawing out various ideas on charter promotion.

Transit Pars Gets Heavy Support

• AN ALL-OUT OFFENSIVE to gain ground for Transit Pars sparked the regional and divisional conferences of the American Transit Association, held in New York City on April 27-30.

It was a big get-together, with more than 375 ATA men and their guests attending.

South Suburban Safeway's Paul Dittmar led off the Pars campaign in the management session. And he set the stage for heavy artillery backing by two of the industry's big guns.

"If you're not making a profit," asked Dittmar, "what's your alibi?"

Some properties are making money, Dittmar said. And almost without exception they are the ones who use the management tool of Transit Pars.

Heavy support for Pars was then called into action. In the audience were Roswell F. Thoma of Niagara Frontier Transit and Fred A. Ossanna of Twin City Rapid Transit—two of the successful operators mentioned by Dittmar.

Ossanna and Thoma both delivered off-the-cuff speeches in which they gave Transit Pars a big part in the success of their companies.

Informing employees about company business was also discussed by management.

Oscar Rexford of St. Louis PS, F. Norman (Pinky) Hill of Capitol Transit in Little Rock and Don Walker of Fort Wayne Transit all hit on the importance of letting employees know what's going on in the company.

"PROFITS CAN BE MADE IN TRANSIT." That's what Paul Dittmar is telling management men as he urges the use of Transit Pars. ATA president Wingerter looks on.

MAINTENANCE SESSIONS DREW BIG CROWDS at the New York meeting. Here shop men are taking part in a spirited discussion of pars as applied to maintenance.

SOME IDEAS ON CONSOLIDATING ROUTES are given by Randy Randolph of Charleston, W. Va., as Cleveland's Don Hyde nods agreement at the Operations meeting.

TWO SUCCESSFUL OPERATORS compare notes after a session. Jesse Haugh, left, of Metropolitan Coach Lines in California, talks with Twin Cities' Fred Ossanna.

at Big ATA Meeting in New York

They were joined by Fred Ossanna, who described the value of working closely with union leaders to get company policy across to all personnel.

Maintenance men couldn't quite agree on Pars at their all-day session.

The hundred or so who attended listened to speakers who split on the question—with opponents fearing that a set Pars figure might be misused by management.

A cost-per-hour system of comparing maintenance costs was called for by Frank McManus of New Jersey Public Service.

The present cents-per-mile system, he said, doesn't take into account variations between long high-speed runs and short in-city runs.

Along the same lines was a discussion on job analysis for major types of maintenance.

Shop men present argued that a job breakdown would first have to be made, varying from property to property. Secondly, they said, the jobs would vary from worker to worker, making true comparisons difficult.

Nevertheless, they felt standardizing jobs might work . . . and the question was referred to the appropriate committee of the Mechanical Division.

Sessions took the form of question and answer discussions ranging from maintenance management to out-and-out mechanical problems such as correcting front-end shimmy. (The Connecticut Company's solution to this problem is found on page 33 of this issue—ed.)

Continued on next page

FIELD TRIPS WERE ON THE AGENDA for the Electrical Division. Here members are shown touring the New York Transit Authority's Overhead Dept. School.

OSCAR W. REXFORD, vice-president of St. Louis PS, addresses the Operating Division on driver public relations. Paul Rust, meeting chairman, is listening.

TWO COMPARATIVE NEWCOMERS to transit talk with veteran Harley Swift, center. Left: Wilbur Kellogg of Cincinnati; right: Roswell Thoma of Niagara Frontier.

THERE WAS TIME FOR PRIVATE DISCUSSIONS after each session. Here Paul Dittmar of South Suburban is talking to F. Norman (Pinky) Hill of Capitol Transit.

ENJOYING AN INFORMAL LUNCHEON at the New Yorker are Mrs. Larry Wingerter, Bob Sloan, Mrs. George Anderson, Jerry Graybiel, Flo Sheridan and K. L. Calhoun.

SOME ATA SAFETY PLAQUE WINNERS pose with Cyril Ainsworth (seated, center), Awards Committee Chairman. Twenty-one companies received safety awards.

SUPERVISORY FUNCTIONS was the subject of this Operations panel. L. to r. are Cliff Foster, A. T. Warner, Bob Dalgleish, moderator; J. Tuten and H. Musson.

TWO BROTHERS MEET IN NEW YORK for the sessions. At left is Ed Pellissier, of Columbus Transit, Ohio, with Louis D. Pellissier, of Holyoke Street Railway.

TRAFFIC CONGESTION PANEL got big play in New York papers. Speaking above is chairman Edmund Wagner, VP of New York's Commerce and Industry Association.

In the chair at the morning session was George E. Taylor, superintendent of operations for Baltimore and Annapolis Railroad Co., who represented the Small Operations Division. J. A. Moreland, maintenance VP for Fifth Avenue Coach, represented the Mechanical Division and served as afternoon chairman.

At the Electrical Division meeting Charles Guernsey, vice-president of Marmon-Herrington, charged that present accounting methods, based on cost per mile, are not uniform and fail to give a true comparison of one vehicle or one line with another.

Present systems, he said, are unfair to trolley coaches, which are quite frequently charged with power far in excess of what they actually use.

Guernsey suggested using cost-per-passenger-carried as a yardstick to measure vehicle performance.

He also commented on facts brought out in another discussion by J. A. Noertger, of Cincinnati Transit Co.

Detailed tests run by CTC showed that a trolley coach, in making ten stops per mile, operated at a cost of approximately 5.75 cents per mile. When it makes only four stops, the cost per mile drops to 3.4 cents.

Diesel buses operating under similar conditions on CTC routes ran at 6.73 cents per mile when making 10 stops, and 4.3 cents when there were only four stops.

The Operations Division led off with a four-man panel on selection and training of supervisors, headed by Bob Dalgleish of Philadelphia Transportation Co.

Panel members were Cliff Foster of Delaware Coach; H. L. Musson of Capital Transit; John Tuten of Harrisburg Railways and A. T. Warner of Public Service Co-ordinated Transport.

Conclusions were that supervisors should be promoted from the ranks on a merit basis . . . but opinion was split on whether or not a supervisor who loses that status should be permitted to go back driving a bus.

The value of individual company research in the solution of transit problems was discussed by a group of research men, headed by ATA's Walter Rainville, Jr.

Don Hyde, general manager of Cleveland Transit, created great interest with a description of express service in Cleveland, where Hyde credits it with keeping rider loss to a minimum.

The Small Operations Division talked about charters . . . and about a lot of other things, too. Service reductions, supervision, advertising, new revenue sources, bargain fares, losing lines, insurance, parking and parking lots . . . all came up for discussion.

Leonard Samworth, of Ohio Valley Bus Co., who presided at the meeting, described a successful charter promotion in which school children tour a local dairy, with the dairy picking up the charter tab.

One of the hottest discussions was on the matter of cutting service on losing lines. Some felt that it shouldn't be done . . . that losing lines are necessary if you want to keep riders on the good lines.

But the majority felt that it was foolish to maintain the poor lines at a loss.

"After all," they said, summing up the feeling of the entire meeting, "we're in this business to make money."

ABOUT PEOPLE . . .

DR. HARRY L. PURDY has been named vice-president in charge of transportation for the British Columbia Electric Railway Company. He will continue as vicepresident in charge of the gas division.

IVOR W. NEIL, general manager of the transportation division for British Columbia Electric Railway Company has retired after 30 years with the firm. He will be retained in a consulting capacity.

DONALD H. CULVER has been elected assistant secretary of the Cincinnati Transit Company. With the company since 1948 he has served in several departments under special training programs.

HARVEY J. FINISON has been appointed director of engineering for National Pneumatic Company, Inc. and Holtzer-Cabot divisions. He previously was with the Armour Research Foundation of Chicago.

NATHANIEL E. DUVAL, former vice-president and director of the Massachusetts Mohair Plush Company has been named president of the Michiana Products Corporation. He succeeds Otto Carry, who has retired.

DONALD P. HESS, president of American Bosch Corporation since 1938, has been elevated to the post of chairman of the board of the corporation. He succeeds Joseph E. Ridder who recently retired.

E. F. Furry, president of Indiana Motor Bus Company has been elected president of the Indiana Bus Operators Association. Other officers elected were **John E. Morley** and **Earl Parkhill,** vice-presidents; **B. C. Hall,** treasurer and **Harry J. Harman,** secretary.

Howard T. Pullen has joined A. Schrader's Son division of Scovill Manufacturing Company as sales representative. He will cover Kansas, Nebraska and Western Missouri.

Formerly with firms in New York and New England he will now make his office in Kansas City.

Robert C. Baker, executive vice-president of the American Security & Trust Company has been elected to the board of directors of Capital Transit Company. He succeeds Daniel W. Bell, president, American Security & Trust Company, who did not stand for reelection.

James H. Flanagan, former chairman of the District of Columbia Public Utilities Commission has been elected vice-president and comptroller of the Capital Transit Company.

Flanagan, a CTC vice-president since 1953, will succeed Robert E. Harvey, who recently resigned.

J. P. Dragin, assistant vice-president—finance of White Motor Company's Sterling division, was elected controller of White Motor.

He has been associated with the firm since 1945 when he started as technical assistant in the field of audit and systems.

Blaylock Atherton, former president of the New Hampshire State Senate has been named by Governor Hugh Gregg and the Executive Council as a member of the New Hampshire Public Utilities Commission.

He succeeds Henry G. Wells, who died recently.

L. C. MAJOR, president of the Richmond Greyhound Lines who recently underwent an operation is now back at his job with the Greyhound Lines. He reports that the operation was a complete success.

CHARLES W. PERELLE has been elected president and a director of American Bosch Corporation and its subsidiary, Arma. He formerly was president and general manager of the ACF-Brill Motors Company.

Frederic Attwood, vice-president in charge of eastern territory for the Ohio Brass Company has recently retired. With the company since 1920, he was elected to the post of vice president and named a director of the firm in 1927. He will continue to service as V.P. and director.

Philip B. Willauer, who has been associated with the transportation engineering firm of Simpson & Curtin since 1947, has been appointed general manager of Highway Carriers Employers Association, Inc., Chicago, which represents truck operators in Illinois, Indiana and Wisconsin.

Nels J. Floan, regional manager for Pennsylvania Greyhound Lines has been elected to the post of president of the Ohio Motor Bus Association. He has been associated with the transportation industry for 30 years.

Joseph G. Van Nest has been appointed vice-president in charge of purchasing for the Purolator Products, Inc. **Herbert W. Thogode** has been appointed director and secretary-treasurer of the company.

Robert Hill has been named manager of the Jordan Bus Company. He will succeed **Robert Jordan,** vice-president of the company who leaves for a two year tour with the Air Force.

C. A. Johnson, president of the Central Illinois Securities Corporation has been elected a director of Mack Trucks, Inc.

Harold L. Fierman and **Stuart Hedden** were also elected to the board.

Fred C. Worden, who has been general manager of the bus subsidiaries of North Shore System, Inc., has been elected vice-president of the system and its nine bus subsidiaries.

Sidney H. Bingham, executive director and general manager of the New York Transit Authority recently left on a ten-day trip to Europe.

He will make a personal inspection of transit facilities and discuss transit problems in France, Sweden and England.

Kenneth E. Steinreich has been elected a director of the New York City Omnibus Corporation.

He succeeded the late David H. Knott. Mr. Steinreich is a vice-president and director of Jacob Ruppert.

Fred J. Burt has been appointed general sales manager of the Johnson Fare Box Company, a subsidiary of Bowser, Inc.

John E. Tarrant has been re-elected chairman of the Louisville Transit Company. Other officers re-elected were: **Frederick J. Johnson,** president; **Robert Alexander,** vice-president; **Charles A. Heuser,** treasurer, and **Russell C. Mayhall,** secretary.

John W. Leake, vice-president of the Louisville Transit Company, will be director of Louisville's new department of sanitation. He has been associated with the transit company for 26 years.

William Nelson has been named acting president and a director of ACF-Brill Motors Company and will also be general manager of the company, including its Hall-Scott motors division at Berkeley, Calif. He has been a vice persident of ACF-Brill for five years.

Robert E. Harvey has resigned as vice-president and controller of the Capital Transit Company, to become executive vice-president and general manager of the Newport Steel Corporation.

S. G. Coppel has been appointed executive vice-president of Pacific Transport Lines, Inc. He formerly was vice-president of the lines.

Walter L. Jacobs has been elected a vice-president and director of Omnibus Corporation. He will remain as president and general manager of Hertz System, Inc., a wholly-owned Omnibus subsidiary.

William Purdy, supervisor of traffic study for Ottawa Transportation Commission has been appointed assistant general manager.

Lee D. Whitney, owner of the Interstate Bus Lines, Inc., Rochester, N. H. has been elected president of the Greater Rochester Chamber of Commerce.

A. Borden Amo has been promoted to the position of operational superintendent of the York Coach Lines, Toronto, Canada. He formerly was associated with the Canadian National Railways.

Earl W. Beck has been named general purchasing agent of Socony-Vacuum Oil Company. He succeeeds Joseph R. Taylor who has retired.

Continued on next page

CHARLES R. CROWDER, executive vice-president of Van Norman Company has been elected president of the Springfield Chamber of Commerce. He has been affiliated with the company since 1929.

D. D. ROBERTSON has been promoted to the post of director of sales for the Dana Corporation. Formerly general sales manager of the company, he has been associated with them since 1937.

CHARLES C. DYBVIG has been appointed general sales manager of the Dana Corporation. He previously was with the Firestone Tire & Rubber Company where he served as a sales engineer.

A. J. Sutherland has been elected to the board of directors of Metropolitan Coach Lines. He is president of the Security Trust & Savings Bank in San Diego, Calif.

BUS AND TROLLEY BUS DELIVERIES

Motor Bus Deliveries	Number of Buses	Manufacturers	Model and Types	Seats
Albuquerque Bus Co. (N. Mex.)	3	GMC	TDH-4512	45
Arrow Line (Conn.)	2	GMC	PD-4104	41
Asbury Rapid Transit System (Calif.)	10	Flxible	FT2P-40	54
Blue & Grey Corp. (N.J.)	5	GMC	TDH-4512	45
Campus Travel Inc. (N.Y.)	1	GMC	PD-4104	41
Central New York Coach Lines (N.Y.)	2	GMC	TDH-4512	45
Chicago Transit Authority (Ill.)	24	Flxible	FL-2P-40	52
Cincinnati, Newport & Covington Railway Company, (Ky.)	4	GMC	TDH-4512	45
Gray Railways Inc. (Ind.)	1	GMC	TDH-4512	45
Great Lakes Greyhound Lines (Mich.)	7	GMC	PD-4104	41
Hudson Transit Lines, Inc. (N.J.)	8	GMC	PD-4104	41
Indianapolis Transit, Inc. (Ind.)	2	GMC	TDH-4512	45
Intercity Transit Lines, Inc. (N. Mex.)	1	Flxible	218GM1	29
Interstate Passenger Service (N.H.)	1	GMC	PD-4104	41
Intertown Suburban Bus Lines Corp. (Mich.)	3	GMC	TDH-4512	45
Las Vegas Tonopah Reno Stage Lines (Nev.)	2	GMC	PD-4104	41
Martin Lines, Inc. (Mich.)	3	GMC	TDH-4512	45
Robert J. McIntyre, Inc. (N.J.)	1	GMC	TDH-4512	45
Missouri Pacific Transp. Co. (Mo.)	3	GMC	TDH-4512	45
Nashville Transit Co. (Tenn.)	15	GMC	TDH-4512	45
Northland Grayhound Lines, Inc. (Minn.)	7	GMC	PD-4104	41
Overland Greyhound Lines (Nebr.)	5	GMC	TDH-4512	45
Pacific Greyhound Lines (Calif.)	20	GMC	PD-4104	41
Pennsylvania Greyhound Lines (Ohio)	15	GMC	PD-4104	41
Peter Pan Bus Lines (Mass.)	3	GMC	PD-4104	41
Philadelphia Suburban Transp. Co. (Pa.)	4	GMC	TDH-4512	45
Pittsburgh & Weirton Bus Co. (W. Va.)	8	GMC	TDH-4512	45
Quaker City Bus Co. (N.J.)	6	GMC	PD-4104	41
St. Joseph Light & Power Co. (Mo.)	1	Southern	S-36 DHL	36
Southern Coach Lines, Inc. (Tenn.)	2	Southern	S-45 HF	45
Scarsdale Bus Corp. (N.Y.)	1	GMC	TDH-4512	45
South Suburban Safeway Lines, Inc. (Ill.)	6	GMC	TDH-4512	45
Southeastern Greyhound Lines (Ky.)	6	GMC	PD-4104	41
Springfield Street Railway Co. (Mass.)	10	GMC	TDH-4512	45
Tech Greyhound Lines, Inc. (La.)	2	GMC	PD-4104	41
Transportation Properties, Inc. (Ark.)	12	GMC	TDH-4512	45
Virginia Stage Lines, Inc. (Va.)	9	GMC	PD-4104	41
Miscellaneous Deliveries				
Pikes Peak Automobile Co.	4	Flxible	146F6	21
Superior Electric Co. (Conn.)	2	Flxible	218B1	Special
Universal Pictures Co., Inc. (Calif.)	1	Flxible	218FA1	29
Foreign Deliveries				
General Motors Foreign Distributors Div. (N.Y.)	20	GMC	TDH-4512	45
General Motors Prod. of Canada (Can.)	10	GMC	TDH-4512	45

Total deliveries reported in this issue.. 254

NOTE: This list is based on monthly reports from manufacturers. Not all manufacturers report regularly, consequently, this list is not to be considered complete.

Obituary

Eugene Lynde, former owner and superintendent of the Dover, Somersworth & Rochester Street Railway. Mr. Lynde has been in the transportation industry since 1885.

Merrell Mandel, auditor and comptroller of the Rochester Transit Corporation. He had been affiliated with the company since 1925.

Philip R. Peters, president of the Lancaster Power and Traction Company. His father, Henry Peters, developed the first mass transportation system in Lancaster in 1894.

Royce G. Martin, president and chairman of the board of the Electric Auto-Lite Company.

Wesley F. Baum, president of the Beaver Valley Motor Coach Company.

Mr. Baum was also president of the Woodlawn and Southern Motor Coach Company and the Beaver Metropolitan Coaches.

F. W. Wilkening, president and chairman of the board of directors of the Wilkening Manufacturing Company.

George C. Lees, president and general manager of the United States Axle Company. Mr. Lees founded the company in 1919.

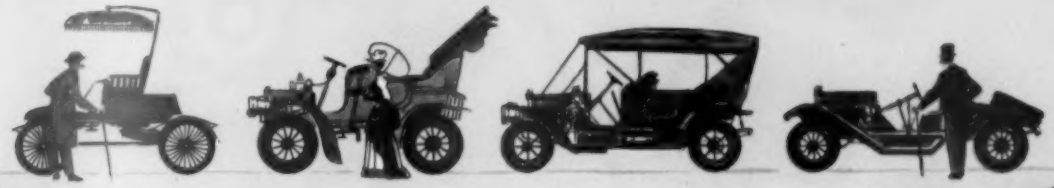
Frank Karr, former general counsel and vice-president of Pacific Electric Railway Company.

Mr. Kerr retired in February of this year after 42 years of service with the company.

William H. Chilton, vice-president in charge of transportation of the Syracuse Transit Corporation.

Mr. Chilton joined the company in 1905 as a trolley conductor.

WE WERE THERE...



WE WILL BE THERE

Spicer has been through all the phases and cycles of automotive development during the past 50 years. Spicer has been a major factor in the progress of the motor vehicle from a clumsy, noisy machine to a sleek, fleet, worldwide method of transportation.

Spicer now looks forward to its second 50 years of participation in automotive advancements. Working together hand in hand with designers and engineers on the vehicles of the future, the Dana organization will continue to develop Spicer power transmission units that will maintain their reputation as

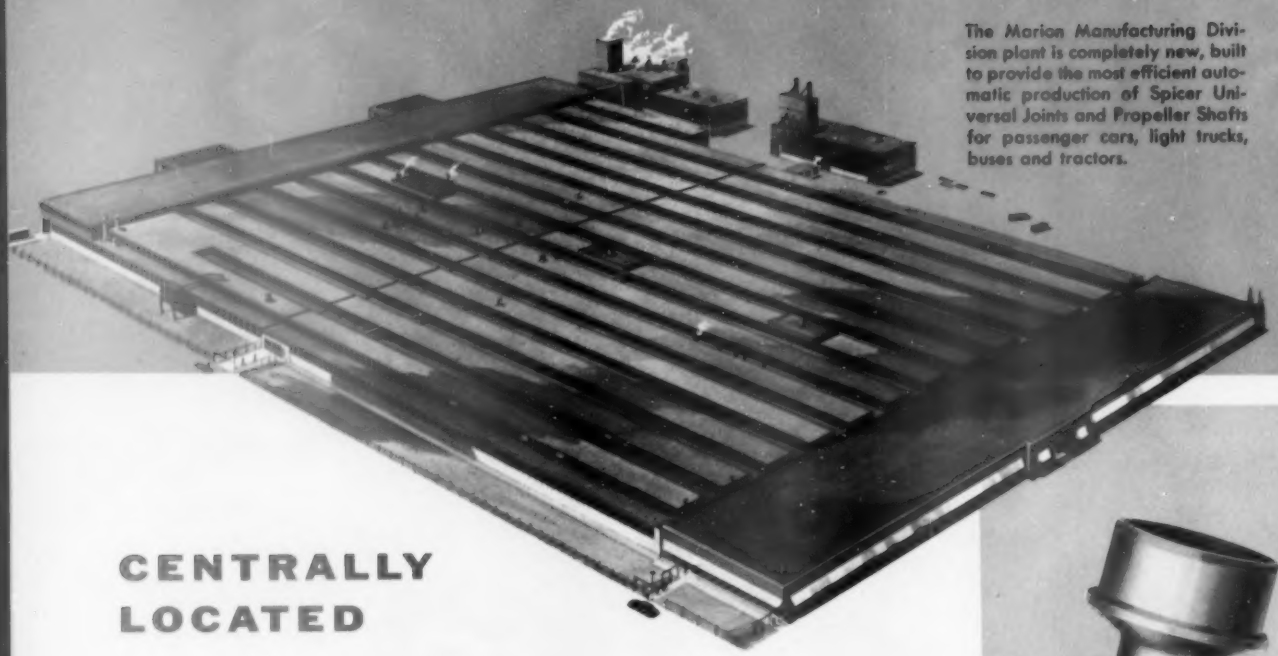
"The Standard of the Industry"

ENGINEERING

DANA

MANUFACTURING

THIS IS THE MARION MANUFACTURING DIVISION IN MARION, INDIANA



The Marion Manufacturing Division plant is completely new, built to provide the most efficient automatic production of Spicer Universal Joints and Propeller Shafts for passenger cars, light trucks, buses and tractors.

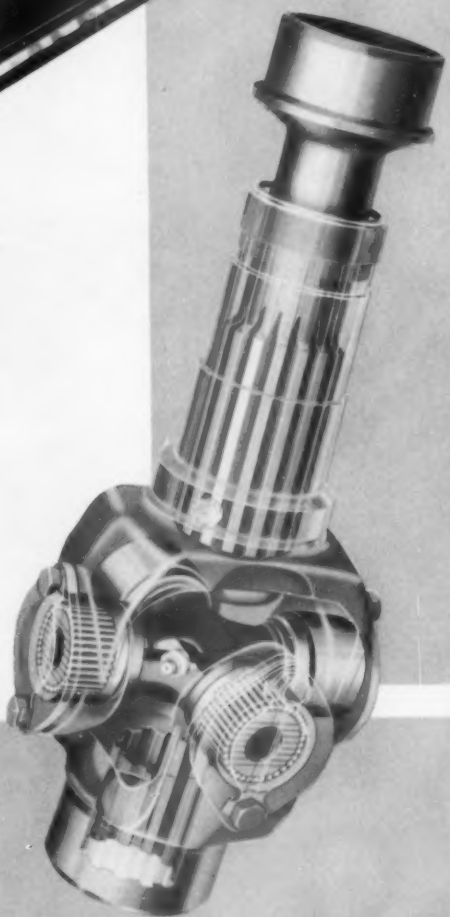
CENTRALLY LOCATED

and assuring a convenient, dependable source of supply for the automotive industry

For fifty years, Spicer Universal Joints . . . *first in the industry* . . . have been in volume demand because of outstanding service features:

1. True bearing alignment with rigid one-piece yoke design. *This rigidity is the essence of accuracy.*
2. Precision bearings with improved surface hardness and finish.
3. Dynamically balanced to exacting limits.
4. Uniform high quality propeller shaft tubing. *Steel meets our special specifications for Spicer propeller shaft needs.*
5. Wide selection of flange and yoke types and sizes to suit each individual requirement.

Spicer facilities are diversified and convenient, to fill your needs efficiently in power transmission units.



SPICER MANUFACTURING DIVISION
of Dana Corporation • Toledo 1, Ohio

50 YEARS OF Spicer SERVICE

ENGINEERING DANA MANUFACTURING

TRANSMISSIONS • UNIVERSAL JOINTS • PROPELLER SHAFTS • BROWN-LIPE and AUBURN CLUTCHES • FORGINGS • AXLES • STAMPINGS • SPICER BROWN-LIPE GEAR BOXES • PARISH FRAMES • TORQUE CONVERTERS • POWER TAKE-OFFS • POWER TAKE-OFF JOINTS • RAIL CAR DRIVES • RAILWAY GENERATOR DRIVES • AIRCRAFT GEARS • WELDED TUBING

FINE FOR FLEETS

WAGNER® BRAKE LINING

assures longer wear and quick, safe, smooth stops

Give your drivers the good brakes they deserve by relining with Wagner Brake Lining, and you'll be miles and money ahead in the long run.

Wagner knows brakes, and knows what is required of brake lining. Wagner's background of research and experience assures you of the following advantages:

1. UNIFORM TEXTURE assures same type of brake surface always being exposed to the drum.

2. CONSTANT FRICTION permits smooth even deceleration.

3. NON-COMPRESSIBLE—and won't swell. Brakes won't require frequent adjustment.

4. CONTAINS NO ABRASIVE material. Easy on drums.

5. LONG-LIVED and age proof—does not deteriorate with age.

Wagner Brake Lining is available in sets, blocks, rolls, slabs, cut segments, and on shoes—either bonded or riveted.

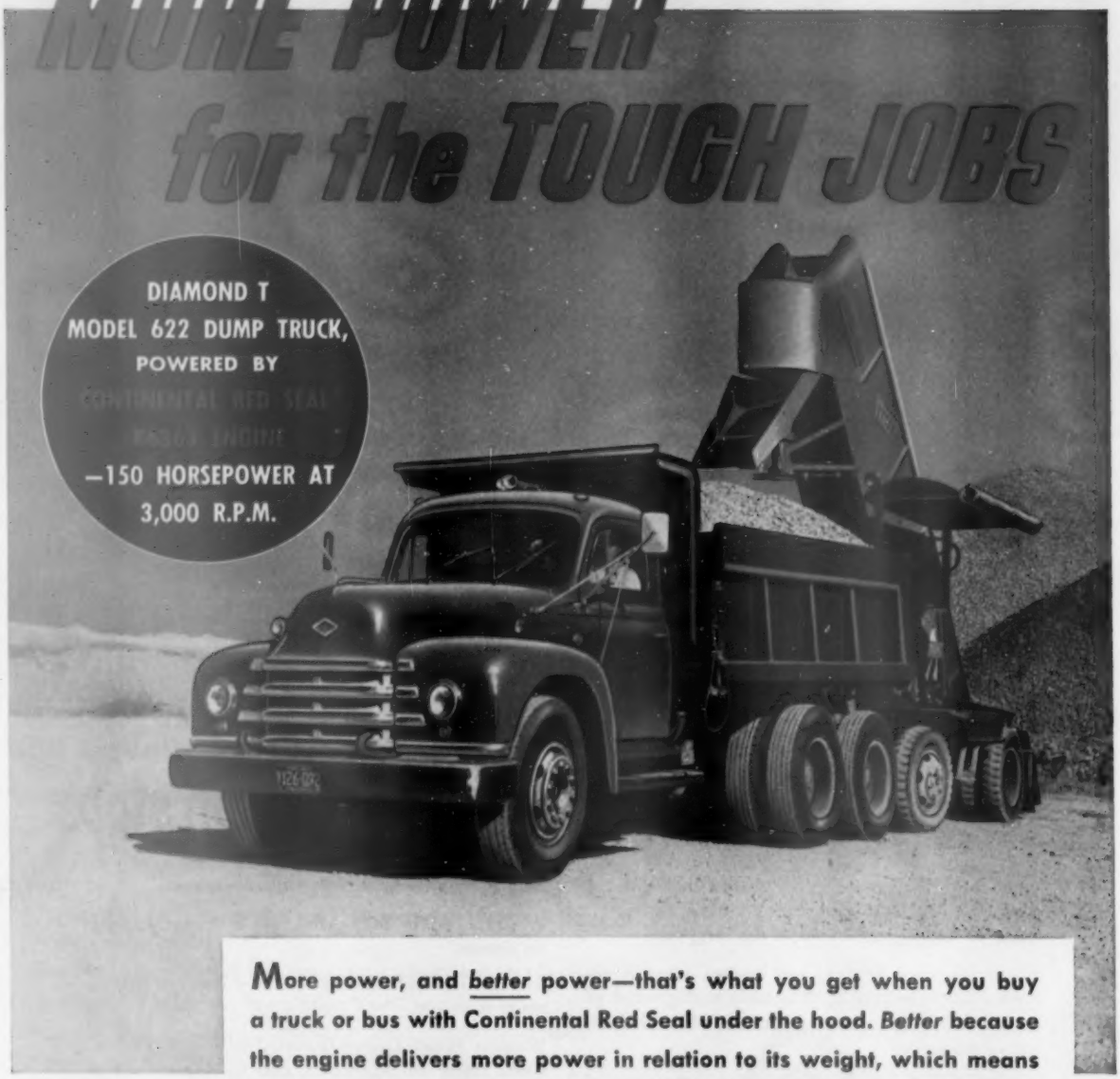
It will pay you to standardize on this line of superior quality brake lining—coverage is complete for all brakes, large or small. Let *one source* take care of *all* your needs.

Wagner Electric Corporation
6461 Plymouth Ave., St. Louis 14, Mo., U. S. A.
(Branches in principal cities in the U. S. and in Canada)

EST. 1891 **Wagner** *...the best known name in brake service*

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • HeRoL • CeMoX BRAKE LINING • AIR BRAKES
TACHOGRAPHS • ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL CRANE BRIDGE BRAKES

MORE POWER for the TOUGH JOBS



More power, and *better* power—that's what you get when you buy a truck or bus with Continental Red Seal under the hood. *Better* because the engine delivers more power in relation to its weight, which means higher payload capacity. Better, too, because the output is delivered at engine speeds conducive to fast over-the-road travel with a minimum of shifting. For the really tough jobs, choose a vehicle with a power plant that's engineered and built for the tough jobs and backed by specialized experience dating from 1902.

PARTS AND SERVICE COAST TO COAST

*TM REG.

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD

Continental Motors Corporation
MUSKEGON, MICHIGAN

1819 BROADWAY, NEW YORK 23, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

RECORDS TELL HOW GOOD A MOTOR OIL IS!

Ray Mills, Maintenance Superintendent, holds up dip stick to emphasize his point on good oil consumption.

CASE HISTORY

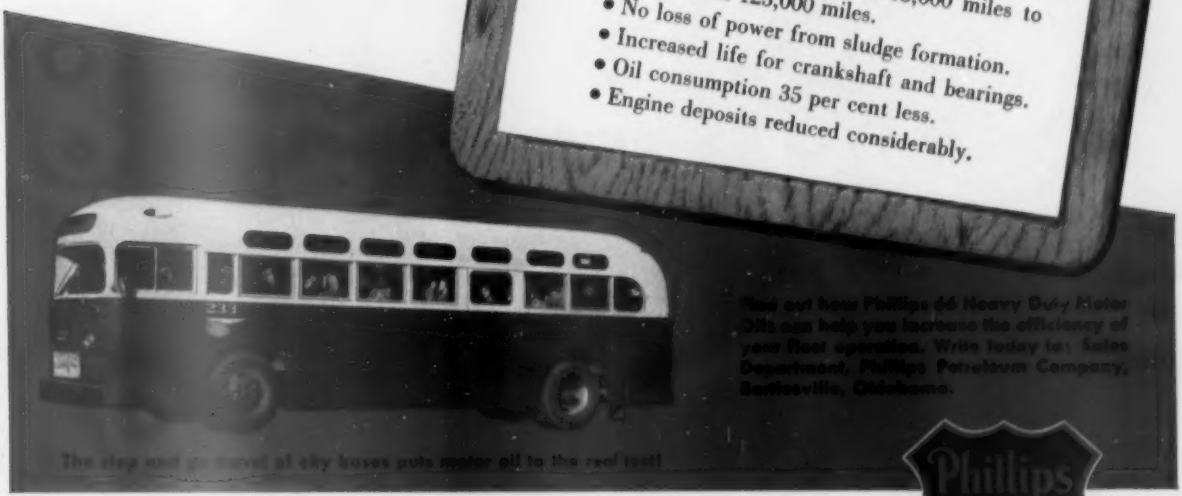
"Our operating records tell the story of what *we're* getting out of the motor oil we use," says Ray Mills, Maintenance Superintendent of City Bus Company, Oklahoma City, Oklahoma.

And City Bus Company must keep accurate, up-to-date records! Operating over 140 city buses, both diesel and gasoline, on day and night schedules, a careful check must be kept on the efficiency of each vehicle. With a timetable to meet in all kinds of weather and 5,000 miles a month for each bus with idling engines plus low gear stop and go travel, Mr. Mills demands a motor oil that in his own words, "resists oxidation and bearing corrosion as well as holding sludge in suspension."

That's why City Bus Company standardizes on Phillips *66* Heavy Duty Motor Oil in all their buses. The oil they were previously using just couldn't "measure up" to such exacting standards —and the result was inefficient operation.

"We have kept our engines cleaner and engine life has increased considerably since we started using Phillips *66* Heavy Duty Motor Oil," said Mr. Mills enthusiastically. "It has helped reduce over-all maintenance costs greatly. The records speak for themselves."

- Overhauls extended from 65,000 miles to better than 125,000 miles.
- No loss of power from sludge formation.
- Increased life for crankshaft and bearings.
- Oil consumption 35 per cent less.
- Engine deposits reduced considerably.



Test out how Phillips 66 Heavy Duty Motor Oils can help you increase the efficiency of your fleet operation. Write today to: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

The step and go travel of city buses puts motor oil to the real test!

Oil for the Engines of Commerce

Phillips 66

PHILLIPS 66 HEAVY DUTY MOTOR OIL

Best part of any service job

YOU can bet these GM Coaches are getting a top servicing job. That fully equipped shop—those expert mechanics—are sure signs of good maintenance work. But that's only part of this picture's story.

You see, they're installing genuine GMC parts as replacements. What's more, they use GMC parts in *every* repair or overhaul.

For this operator wants to insure the standout performance of his whole fleet. So he does just that—by insisting on *parts made in the same factories—on the same machines—to the same high standards as those in a brand-new GM Coach.*

That cuts shop-time, too. There's more mileage between shop visits. And GMC parts *never* require a single minute of workbench tailoring. It pays to let GMC do *all* the engineering!

is a part labeled "GMC"

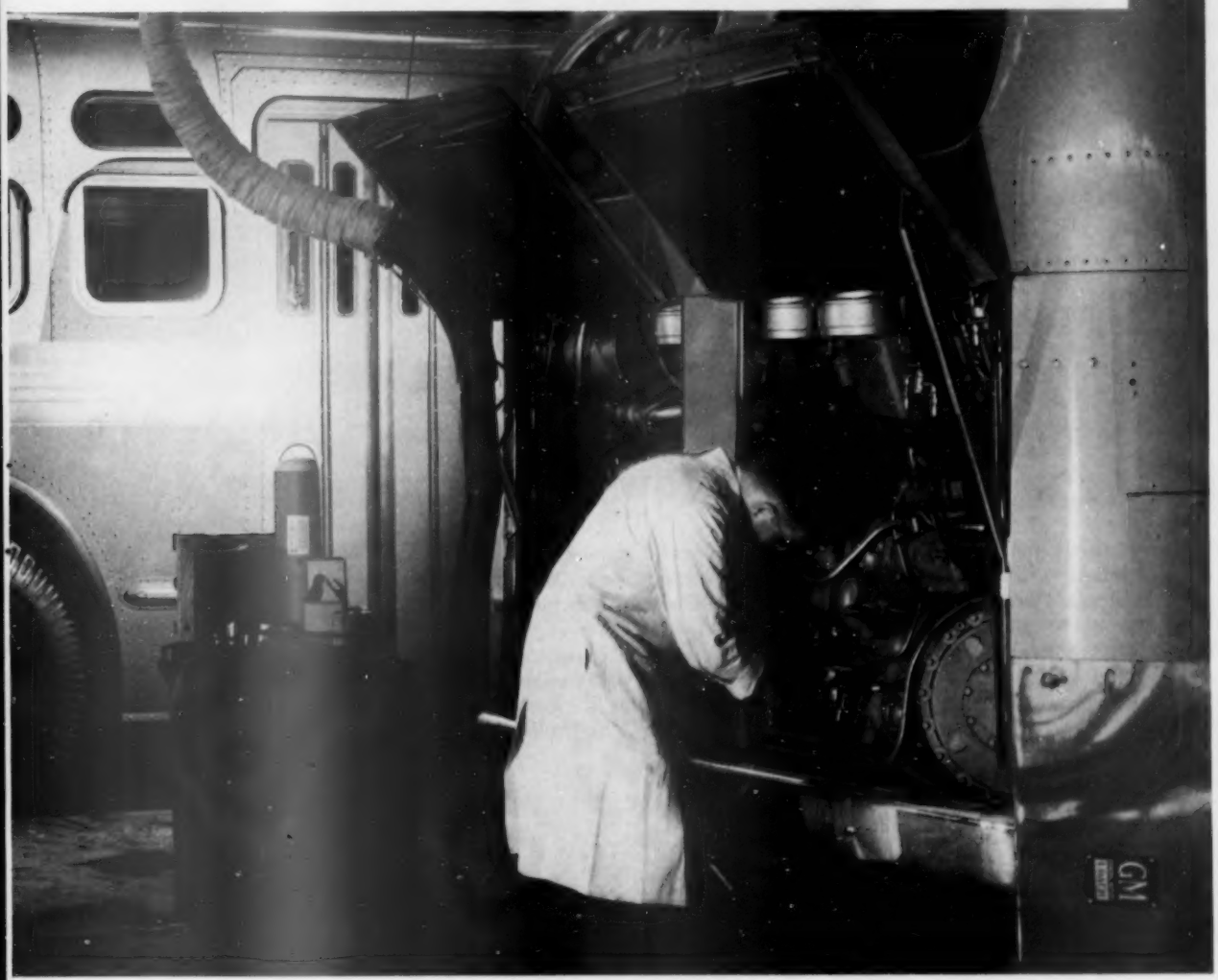
And remember—GMC Replacement Parts are always quickly and easily available. Fully stocked GMC Parts Warehouses are spotted at Oakland, Cal., Pontiac, Michigan, Hillside, N. J., Boston, Chicago, Dallas, Memphis, Atlanta and Denver.

They offer the surest—and safest—solution to the maintenance problems of GM Coach operators in any part of America.

—best part of any service job!

GMC Truck & Coach Division of General Motors

Be careful—drive safely



FLEET OWNERS:

Big NEWS! Big SAVINGS!

For Fleets Only

PUROLATOR PUR-PAK elements

in low-cost fleet package

Now you can get dependable, low-cost filtration with Purolator Pur-Pak elements. Purolator Pur-Pak elements are specially packed and sold to fleet operators at the lowest possible cost.

Pur-Pak elements are constructed of the finest, lint-free cotton fibre, selected to give maximum service in oil filter applications. The dirt retention abilities of this filter are unsurpassed for its type.

Purolator has the complete line of fleet filters. Pur-Pak for economy; Micronic* where only the best will do! And every Purolator* is backed by the world's largest filter research and production facilities. When you buy Purolator you're sure of getting the very latest in filter development.

Ask your local Purolator Supplier about Pur-Pak. See for yourself how you can get dependable filtration at a budget price.

*Trade mark reg. U. S. Pat. Off.

PurOlator *World's finest* **OIL FILTER**

PUROLATOR PRODUCTS, INC., Rahway, New Jersey and Toronto, Ontario, Canada
Factory Branch Offices: Chicago, Detroit, Los Angeles

means Control here

Providing good service at rush hours is one of the toughest problems transit companies are up against. All sorts of obstacles intervene. Heavier loads, extra trips, traffic tie-ups . . . all of these disrupt schedules, annoy passengers and impair operational efficiency.

Many transit operators are reducing rush-hour difficulties and are saving valuable time in passenger interchange by using National Pneumatic equipment. The new NP Heavy Duty Rack and Gear Engine, especially designed for buses that are pressurized when air conditioned, has more than ample power to open doors quickly and smoothly. It is simply designed, takes less space and requires lubrication only *once every six months.* As a result, maintenance costs and downtime are low.

National Pneumatic Co., Inc., has designed, developed and manufactured door operating and safety control equipment for nearly 50 years. If you have a problem in this field, make use of our experience and facilities. No obligation, of course.

BE SURE . . . ALWAYS SPECIFY NP DOOR CONTROL AND SAFETY EQUIPMENT

NATIONAL PNEUMATIC CO., INC. AND **HOLTZER-CABOT** DIVISIONS

125 Amory St., Boston 19, Mass.

Sales Service Representatives in Principal Cities throughout the World

Designers and manufacturers of mechanical, pneumatic, hydraulic, electric and electronic equipment and systems

...doubles mileage
between crankcase drainings...
with
Shell Rotella Oil

Here's Birmingham's statement "Since using Shell Rotella Oil, we have doubled drain periods with satisfactory results, finding engines considerably cleaner, and feeling that Rotella has contributed to the improved engine life which we have experienced. Our hydraulic valve-lifter trouble has been negligible, which is an improvement over experience with some other oils."

Many other fleet owners from coast to coast are getting the same outstanding lubrication with Shell Rotella Oil.

Shell Rotella Oil gives all these advantages—

1. Superior anti-wear protection
2. Highest oxidation stability
3. Excellent detergent-dispersant action
4. Protection against bearing corrosion
5. Maximum engine service life
6. Greatest over-all economy

Why not let us show you how Shell Rotella Oil can reduce your maintenance costs. Write for latest technical information.

SHELL OIL COMPANY
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SHELL

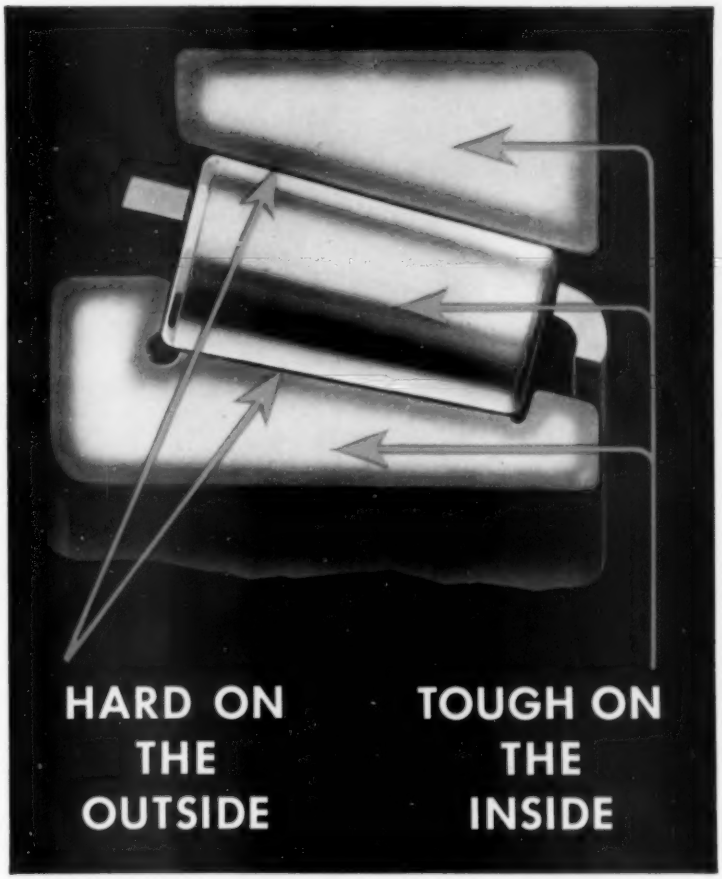
How TIMKEN® bearings get maximum wear resistance

(Another reason why TIMKEN® bearings are first choice with bus manufacturers.)

TO get the finest possible steel for Timken® tapered roller bearings, we make our own—the only bearing company in the U. S. A. that does. Then we case-carburize each race and roller to give them a hard wear-resistant surface over a tough, shock-resistant core.

Only Timken bearings give you *all* these advantages: 1) advanced design, 2) rigid quality control, 3) special analysis Timken steels, 4) precision manufacture.

The men who build busses really analyze bearings. They choose Timken bearings first. So when you install a replacement bearing, make sure it too is stamped with the trade-mark "Timken". And write now for your free copy of our helpful booklet: "Timken Tapered Roller Bearings—Their Care and Maintenance". Write Dept. TB-6, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



SINCE THEY'RE BEST WHEN THE BUS IS NEW, THEY'RE BEST FOR REPLACEMENT, TOO!

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL · NOT JUST A ROLLER · THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST · LOADS OR ANY COMBINATION

Take it from owners:

MARMON-HERRINGTON

Motor Coaches

actually do cut costs—

step up efficiency—

boost profits.

Read what these owners say:

OTS THE FLOATING BRIDGE ROUTE

OVERLAKE TRANSIT SERVICE

GEO. W. POST, Owner

BELLEVUE, WASHINGTON

We have been very well satisfied with the operation of Marmon-Herrington Motor Coaches. Fuel and maintenance costs have been exceptionally good. The riding public's reaction has been most favorable and we have received many compliments on their appearance and ride.

SPRINGFIELD CITY LINES INC.

SPRINGFIELD • • OHIO.

SPRINGFIELD

It gives me great pleasure, after another very successful year of operating a fleet of Marmon-Herrington Motor Coaches, to place an order with you for 10 more coaches, which will give us a fleet of 37 Marmon-Herringtons. I want to mention that your service and availability of parts, when required, has been most prompt and helpful.

CLARKSVILLE TRANSPORTATION CO.

CLARKSVILLE, TENNESSEE

We are much pleased with our Marmon-Herrington Motor Coach with 279 cu. in. V-8 engine. It has unusual power and is economical to operate. We are getting better gas mileage (approximately 7½ miles per gallon) than with either the six cylinder or little eight operated in the past.

GENERAL OFFICES: 70 UNION ST., MEDFORD, MASS. MYstic 6-4450

This company is pleased with the performance and appearance of Marmon-Herrington Motor Coaches. They are economical to operate and maintain, and give good gasoline and oil mileage. Our drivers like their easy handling and our passengers are more than satisfied with the riding comfort.

ST. BERNARD BUS LINE, INC.

ARABI, LA.

I am well pleased with Marmon-Herrington Motor Coaches. The first one purchased has now traveled approximately 450,000 miles, with low operating and maintenance costs. I highly recommend these coaches to anyone interested in this field of transportation.

✻ Almost without exception, owners speak of Marmon-Herrington Motor Coaches in glowing terms. And when you consider that they are now in service on 155 properties in 38 states, Canada, Alaska, Colombia and Puerto Rico—well, you just know they are giving owners a highly efficient and satisfying brand of service.

Marmon-Herrington Motor Coaches are designed and constructed throughout to do an outstanding job in the 27-35 passenger class. Rugged, yet light in weight, they give you the kind of economical performance and long-life dependability that spell profitable, trouble-free operation.

Although modestly priced, Marmon-Herrington Motor Coaches offer many advanced features . . . husky, integral frame and body construction—modern, economical high-compression, overhead-valve V-8 power plants—streamlined styling—cushioned riding comfort.

Discover how Marmon-Herrington Motor Coaches can cut costs and increase profits for you. Ask your Marmon-Herrington dealer for a demonstration—on one of your own routes.

TRANSIT EQUIPMENT DIVISION

MARMON-HERRINGTON COMPANY, INC. • Indianapolis 7, Ind.

NATIONAL DEALER ORGANIZATION

New England Marmon-Herrington Coaches, Inc.
70 New Cross Street • Phone: Somerset 6-5300 • Somerville 45, Mass.

Maxford, Inc.
492 Main Street • Phone: Fort Lee 8-7800 • Fort Lee, New Jersey

Capital Marmon-Herrington Coaches, Inc.
691 Maine Avenue, S. W. • Phone: National 7125 • Washington 4, D. C.

Great Lakes Marmon-Herrington Coach Co.
5280 Oakman Boulevard • Phone: Luzon 2-7500 • Dearborn 1, Michigan

Northwest Marmon-Herrington Coaches, Inc.
1538 West National • Phone: Evergreen 4-6200 • Milwaukee 4, Wisconsin

Midwest Marmon-Herrington Coaches, Inc.
1215 Big Bend Boulevard • Phone: Sterling 5873 • St. Louis 17, Missouri

Southeast Marmon-Herrington Coaches, Inc.
102 East 14th Street • Phone: 3-8605 • Jacksonville 6, Florida

Southwest Marmon-Herrington Coaches, Inc.
4147 Commerce Street • Phone: Tenison 3117 • Dallas 1, Texas

Pacific Marmon-Herrington Coach Sales
2500 E. 12th Street • Phone: Trinity 4025 • Los Angeles 21, California

Cole Commercial Company, Inc.
3423 Fourth Ave., South • Phone: Seneca 1412 • Seattle 4, Washington

Made in Canada by
Welles Corporation, Ltd., Windsor

MARMON-HERRINGTON Motor Coaches

More comfort–
more riders–
more revenue!

American-Karpen

DeLuxe Recliner
Model 1250-5

New comfort features build business

EXTRA SITTING SPACE
. . . two full inches more

OPEN END STANDARD
improves ventilation

MORE ARM COMFORT
Molded plastic side-arms have rubber-pad-upholstered inserts

INSTANT RECLINING
at touch of recessed recline buttons

EASY TO S-T-R-E-T-C-H
. . . extra underseat leg room

SCUFF-PROOF AISLE PEDESTAL
is stamped steel covered with stainless steel

15 LBS. LESS WEIGHT
than earlier models

Write for complete information

Patents Pending

American Seating Company

WORLD'S LEADER IN PUBLIC SEATING

Grand Rapids 2, Michigan • Branch Offices and Distributors in Principal Cities
Manufacturers of Transportation, School, Theatre, Auditorium, Church, Stadium Seating, and FOLDING CHAIRS

Reduce Inventory

Why stock a big assortment of ready-made hose lines when a small supply of Aeroquip bulk hose and detachable, reusable fittings answers the purpose. With Aeroquip you make hose line replacements as they are needed.

You save time, cut costs, reduce inventory!

Aeroquip

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AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: Burbank, Calif. • Dayton, Ohio • Hagerstown, Md. • High Point, N. C. • Miami Springs, Fla. • Minneapolis, Minn. • Portland, Ore. • Van Wert, Ohio • Wichita, Kans.
IN CANADA: Pronco Progress and Engineering Corporation Ltd., Toronto • **IN ENGLAND:** Super Oil Seals & Gaskets, Ltd., Birmingham

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

an ACCO product

Tru-Stop Emergency Brakes

Hold It!

"The best emergency brakes are a must on a fire truck," according to American-LaFrance-Foamite Corporation, builders of all-metal aerial ladder trucks. Like other leading manufacturers of trucks, tractors, buses and special equipment, they offer TRU-STOPS to secure these braking advantages for their customers:

Real emergency braking

TRU-STOPS are real emergency brakes —not just "parking brakes." They serve as auxiliary brakes on long down grades and can bring the vehicle to a smooth, quick stop if power or hydraulic brakes suddenly fail.

Good safety practice demands immediate deadlining of a vehicle after service brake failure. TRU-STOPS can do this and more. They can handle the vehicle with safety so it can be removed from the highway.

Smooth, positive stops

With TRU-STOPS, braking pressure is controlled directly by the pull on the brake lever. There is no self-energizing or "over-braking." The danger of "jack knifing" is reduced.

TRU-STOPS prevent accidents by insuring quick positive stops in emergency situations.

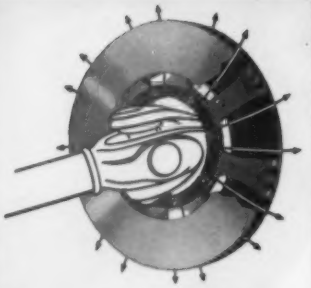
Positive parking brakes

TRU-STOPS hold safely on steep grades —prevent "parking brake" accidents.

Lower service requirements

TRU-STOPS are mounted directly on the drive shaft. Their simplicity of design and accessibility reduce maintenance requirements. Relining or adjustment is a simple job for any mechanic with ordinary tools. It is not necessary to drop drive shaft.

Specify TRU-STOPS for factory installation on your next vehicle.



LONGER LINING LIFE

The terrific heat generated in braking is a big factor in cutting lining life. TRU-STOPS' ventilated disc design quickly dissipates this heat. Most of the disc is exposed to the air even during braking. In addition, a cooling jet of air circulates through the disc, prolongs lining life.

ACCO

Automotive and Aircraft Division
AMERICAN CHAIN & CABLE

601 Stephenson Bldg., Detroit 2
2216 So. Garfield Ave., Los Angeles 22 • Bridgeport 2, Conn.

TRU-STOP Emergency BRAKES

ALL-ELECTRIC PUSH DOOR

Consolidated push-door-control for exit doors offers you these field-tested design features:

- **Built-in safety interlock is positive in action — reduces accident claims.**
- **Electric control eliminates piping and resulting air breakage.**
- **Low maintenance costs.**
- **Simple to install — new or existing buses can be equipped quickly, efficiently.**
- **Rugged in construction — built to last longer — a characteristic of Consolidated's complete line of door operating equipment.**

consolidated

METAL PRODUCTS CORP.
(Formerly Consolidated Car Heating Co., Inc.)

Since 1889

NEW YORK **ALBANY** **CHICAGO**

For complete information address: 413 No. Pearl St., Albany, N. Y.

"One Suggestion Solved 3 Problems...

...Added 50,000 Miles to Life of King Pins and Spring Shackles"

Horace Lane, one of Sinclair's Lubrication Engineers, was faced with a tough problem recently. If you service from one bus to a fleet, the solution should be of interest to you.

Mr. Lane reports, "The assistant superintendent of a large municipal transit system recently presented me with a three-pronged problem. Before switching to Sinclair, the company was running into excessive wear on king pins and spring shackles – torque converter bearings burned out at an extremely high rate and the necessity of stocking three different greases caused an inventory problem."

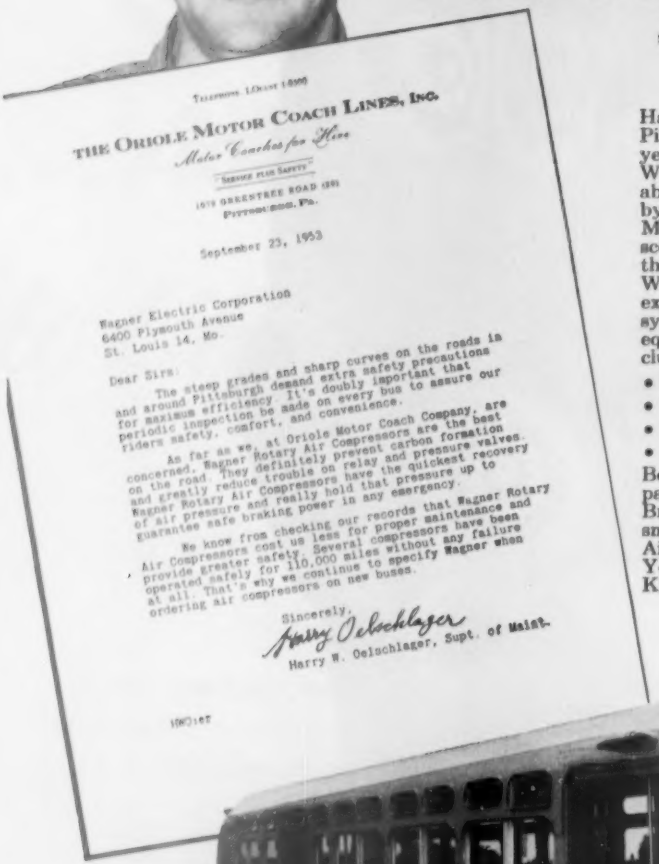
Mr. Lane continues, "Inspection showed that water was washing the grease from the fittings between lubrication periods – which were every 1500 miles. Basing my suggestion on previous experience, I recommended Sinclair LITHOLINE® Multi-Purpose Grease. The company agreed to run a test on over 100 buses, using LITHOLINE exclusively for chassis, wheel bearings and torque converter bearings. *The result was conclusive proof of* LITHOLINE's *superiority*. King pin and spring shackle life was *increased 50,000 miles,* while the loss of torque converter bearings was *entirely eliminated.* At the same time, lube periods were increased from 1500 to 2500 miles. Wheel bearings on the trackless trolleys, which were formerly repacked at 40,000 miles now give every indication of going 100,000 miles without repacking! Of course, LITHOLINE reduced the large grease inventory – this one multi-purpose grease met all requirements."

Whether or not you have a lubrication problem now, a chat with a Sinclair Lubrication Engineer could prove of great value to you. He'd be glad to consult with you, *at no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

. . . SINCLAIR LUBRICANTS

"Wagner Rotary Air Compressors cost us less for proper maintenance and provide greater safety."

says: **HARRY W. OELSCHLAGER, Supt. of Maint.**
Oriole Motor Coach Co., Pittsburgh, Pa.



THE ORIOLE MOTOR COACH LINES, INC.
Motor Coaches for Hire
"SERVICE PLUS SAFETY"
1519 GREENTREE ROAD (20)
PITTSBURGH, PA.

September 23, 1953

Wagner Electric Corporation
6400 Plymouth Avenue
St. Louis 14, Mo.

Dear Sirs:

The steep grades and sharp curves on the roads in and around Pittsburgh demand extra safety precautions for maximum efficiency. It's doubly important that periodic inspection be made on every bus to assure our riders safety, comfort, and convenience.

As far as we, at Oriole Motor Coach Company, are concerned, Wagner Rotary Air Compressors are the best on the road. They definitely prevent carbon formation and greatly reduce trouble on relay and pressure valves. Wagner Rotary Air Compressors have the quickest recovery of air pressure and really hold that pressure up to guarantee safe braking power in any emergency.

We know from checking our records that Wagner Rotary Air Compressors cost us less for proper maintenance and provide greater safety. Several compressors have been operated safely for 110,000 miles without any failure at all. That's why we continue to specify Wagner when ordering air compressors on new buses.

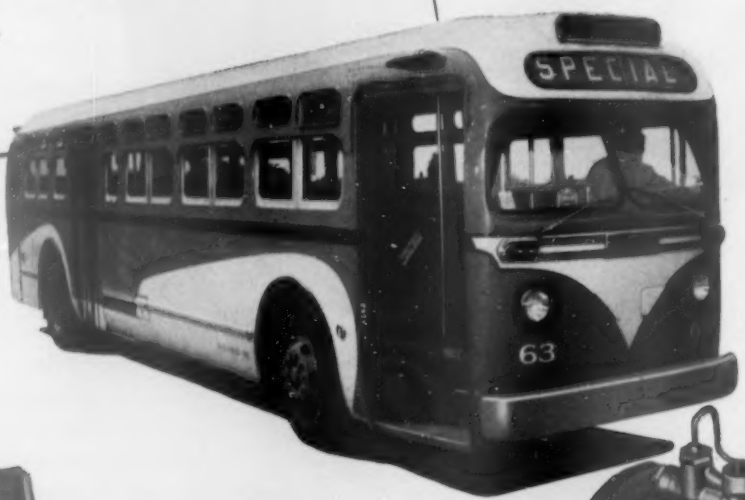
Sincerely,
Harry Oelschlager
Harry W. Oelschlager, Supt. of Maint.

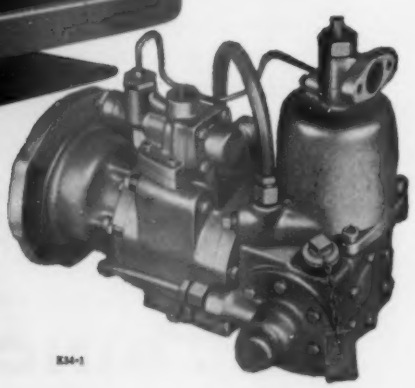
HWO:ef

Harry Oelschlager of Oriole Motor Coach Company in Pittsburgh knows what he's talking about. During his years of experience as Superintendent of Maintenance, Wagner Rotary Compressors have proven their reliable dependability. They have benefited his Company by assuring greater passenger safety at all times. Oriole Motor Coach Company is another fine example of the scores of bus operators who have turned to Wagner for the *best* and *safest* air brake system. This is a reputation Wagner has gained in more than twenty-six years of experience in manufacturing brakes and complete brake systems. Wagner Rotary Air Compressors are standard equipment on all Wagner Air Brake Systems and include these superior features.

- **Rotary motion**
- **Compact installation**
- **Uniform torque load**
- **Interchangeable parts**
- **Fast recovery of air pressure**
- **Infrequent preventive maintenance**

Be dollars ahead in lower maintenance costs and add to passenger comfort and safety—insist on Wagner Air Brake Systems when next ordering new buses. It's smart business, too, to change over to Wagner Rotary Air Compressors on your present fleet of coaches. You can obtain full details, now, in Wagner Bulletin KU-201. Write today for your free copy.





Wagner Electric Corporation
6461 PLYMOUTH AVENUE, ST. LOUIS 14, MO., U. S. A.
(Branches in principal cities in U. S. and in Canada)

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID...NoRol...
CoMoX BRAKE LINING...AIR BRAKES...TACHOGRAPHS...
ELECTRIC MOTORS...TRANSFORMERS...INDUSTRIAL BRAKES

K34-1

COPPER-LEAD HEAVY-DUTY ENGINE BEARINGS

. . . maximum mileage for fleets!

CP SINTERED COPPER-LEADS

Made for mileage! Federal-Mogul's exclusive development, pure copper-lead powder, is bonded to steel in a heat-and-pressure compacting process. This *precision* bearing is overplated, therefore is not resizeable.

CA SINTERED COPPER-LEADS

Produced by the same revolutionary process, Federal-Mogul's CA bearings have higher lead content for use with ordinary crankshafts. Not overplated, they meet the need for flexibility. Standards, undersizes and semi—for resizing or align boring.

FEDERAL-MOGUL SERVICE

Division Federal-Mogul Corporation

DETROIT 13, MICHIGAN

what's she got that attracts people?

FLUORESCENT LIGHTING!

LUMINATOR FLUORESCENT LIGHTING

will do the same for **YOU!**

Smart merchandisers up and down Main Street use Fluorescent Lighting to draw people into their stores. Smart merchandisers among bus operators all over the U. S. are using Luminator Fluorescent Lighting to draw passengers into their coaches. More attractive? Yes! It makes a coach look like a "showcase on wheels." Better lighting? Yes! Fluorescent Lighting is easier on your passengers' eyes, makes for a more comfortable trip. Revenue building? Definitely! People are *attracted* to new coaches with Luminator Fluorescent Lighting installed. It's the new, the exciting, the *profitable* way that alert operators everywhere are using to light new vehicles. Find out about it by writing Luminator, today!

LIGHTING ENGINEERS · DESIGNERS · MANUFACTURERS

LUMINATOR inc.

120 NORTH PEORIA ST., CHICAGO 80, ILLINOIS

IN CANADA: RAILWAY AND POWER ENGINEERING CORP.

Transit Bus

NEW

MODEL 332

New Comfort
New Driving Ease
New Economy

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Subsidiary of
CHECKER CAB MANUFACTURING CORP.

Factory
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Sales Offices
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DETROIT 27, MICH.

Transit CCM Buses, Inc.

B.F.Goodrich

Photo Courtesy Pittsburgh Railways Co.

Koroseal bus upholstery stays new looking for years

SCUFF, scrape or slop—the way the public treats bus seats doesn't matter when you specify Koroseal upholstery. Koroseal lasts for years, is still new looking when leather and other ordinary materials are scratched, torn and worn. This is one reason why bus operators who specify Koroseal automatically save money.

Koroseal stands nearly everything—resists grease, oils, most stains, acids and common chemicals.

After 8 years of use a buyer for one major seat manufacturer says he has *never* had a complaint about Koroseal upholstery.

Koroseal upholstery even resists flame—always goes out when flame is removed. Heavier grades pass all flame-resistance specifications of Federal boards, Army, Navy and Air Force. Flame resistance is permanent, will not leach out. In lighter grades, only the Koroseal coating itself is flame-resisting.

People like to ride on Koroseal—it won't get tacky and stick to clothing in hot weather. And it's easier to slide across, which protects passengers' clothing.

Koroseal is easy to work with, saves upholsterers' time. It cuts, trims and fits with little waste. Everyone benefits when Koroseal is specified—seat manufacturers, coach builders, bus operators and passengers. *Koroseal is made by The B. F. Goodrich Company, Marietta, O.*

Trade Mark—Reg. U. S. Pat. Off.

Koroseal

BUS UPHOLSTERY BY

B.F. Goodrich

INDUSTRIAL PRODUCTS DIVISION

Behind these Doors...

YOUR BUS SEATING PROBLEMS ARE SOLVED!

Ionia's automotive skill, specialized seating experience and years of continuing research have worked together to make Ionia Seats the accepted standard in comfort, economy and durability with many of the nation's leading urban transit systems. Millions of passenger miles daily are test-proving the positive advantages of Ionia bus seating. Thousands of bus operators know a freedom from driving fatigue they never knew before, thanks to Ionia. Hundreds of maintenance men are watching Ionia's superiority record itself in lowered operating costs. When *you* specify Ionia Seating, you are taking the first step in improving friendly relations with your system's passengers and drivers—and doing it with an economy you never thought possible.

Ionia SEATING

IONIA MANUFACTURING COMPANY

A Division of The Mitchell-Bentley Corporation

AUTOMOTIVE SEATING DIVISION

IONIA, MICHIGAN

1 out of every 3 cars in America

Now world-famous Auto-Lite

Outstanding performance in use on many of America's finest cars, trucks and tractors has made Auto-Lite world-famous. This enviable record is possible because only Auto-Lite Ignition Engineering gives you products made by men who have designed and built complete electrical systems for 42 years. So, to match the excellence of finest cars, trucks and tractors with products that protect profits and keep fleets rolling . . . insist on Auto-Lite.

Tune in "Suspense!". . . CBS Radio Mondays . . . CBS Television Tuesdays

is equipped with

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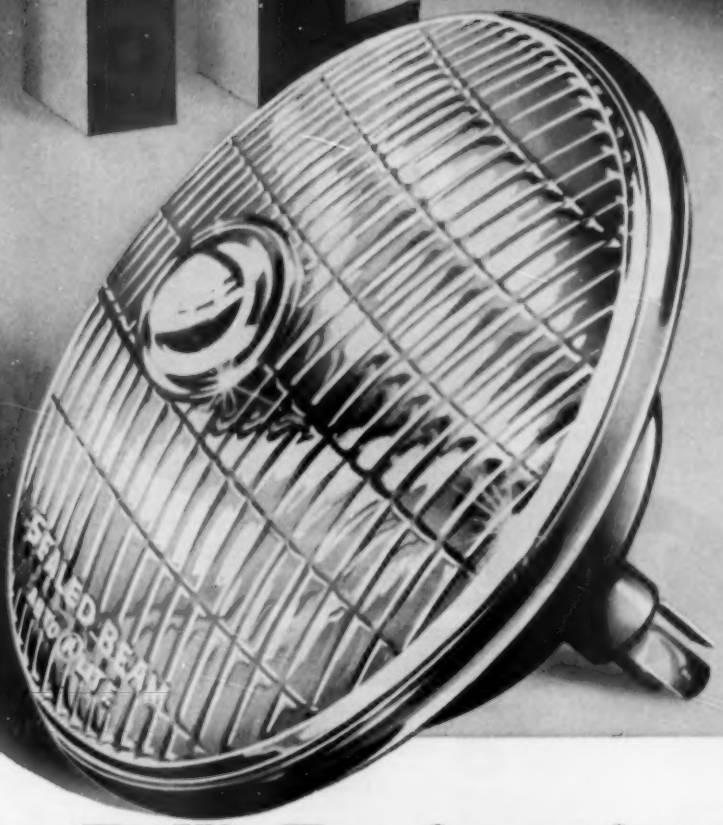


products score Bull's Eye for safety

Auto-Lite Bull's Eye is guaranteed to burn even when lens is cracked or broken

The popularity of Auto-Lite Bull's Eye is breaking all records because fleet owners want a lamp that won't black out—that is guaranteed to burn even when the lens is cracked or broken. When you replace, insist on Auto-Lite, the distinctive original equipment lamp—the only lamp with the Bull's Eye to concentrate more light in the main driving beam. Remember, the Auto-Lite Bull's Eye is available in 6, 12 and 24-volt sizes to fit every electrical system.

THE ELECTRIC AUTO-LITE COMPANY • TOLEDO 1, OHIO

- for engine capacities from 135 to 600 lbs.-ft. torque
- single or double plate
- plate sizes from 9 to 17 inches

LONG

...for heavy-duty clutch requirements

Insistence upon the finest quality has been an inflexible practice at the Long Manufacturing Division for over 50 years. Long quality is proven with the millions of Long Clutches being road tested every day on cars, trucks, buses and tractors.

LONG MANUFACTURING DIVISION • BORG-WARNER CORPORATION

Detroit 12, Michigan, and Windsor, Ontario

CLUTCHES • RADIATORS • TORQUE CONVERTERS • OIL COOLERS

"Excellent Condition After 351,905 Miles With Cities Service C-300 Motor Oil!"

LAKESHORE COACH CO., COLUMBUS, OHIO, HAS USED CITIES SERVICE MOTOR OILS, GEAR OILS AND GREASES FOR 20 YEARS!

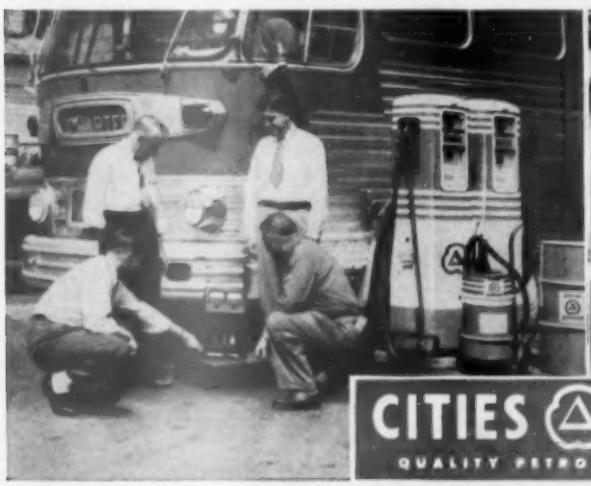
Lakeshore's bus No. 527 was put in operation November, 1950. Since that time, it has been run with Cities Service Heavy Duty C-300 Motor Oil and Cities Service Gear Oils and Greases. As is Lakeshore's policy, No. 527 got its first engine check and overhaul at 147,794 miles. At that point, rings were replaced and sleeves, pistons and bearings were found okay. Engine check, at 351,905 miles, found only slight wear on cylinder walls, while rings, valves, bearings were in excellent condition!

A tremendous tribute to the extra-high quality of all Cities Service Products! For No. 527, it was stop-and-go driving, hill climbing, long engine-racking straight runs. Under all conditions, Cities Service Oils and Greases protected its vital engine parts. Kept No. 527 a paying proposition.

Besides the money-saving performance of Cities Service Lubricants, Lakeshore enjoyed the valuable services of the Cities Service Heat Prover and Power Prover (see below). For more information, call your nearest Cities Service office or write Cities Service Oil Company, Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE HEAT PROVER MEASURES AIR CONTENT OF DIESEL ENGINE EXHAUST GASES. The Lakeshore Coach Co. uses the Heat Prover to evaluate the air losses of diesel bus engines.

CITIES SERVICE POWER PROVER MEASURES THE COMBUSTION EFFICIENCY OF LAKESHORE'S GASOLENE ENGINES to control combustion for maximum engine power and fuel economy.



CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

IN ANY CLIMATE!

YOU CAN DEPEND ON
DELCO SUPER 11 HEAVY-DUTY BRAKE FLUID

Delco Super 11 is a safe, dependable brake fluid in various climates, in any traffic—under severe operating conditions. Use Delco Super 11 with equal confidence in the brake systems of passenger cars, trucks, or buses.

Delco Super 11 heavy-duty brake fluid exceeds SAE specification 70R1 which establishes performance standards for heavy-duty brake fluid, including operating temperature ranges, stability, lubrication, effect on metals and rubber—to name a few—and also exceeds U.S. Federal specification VV-F-451a. Delco Super 11 heavy-duty brake fluid is available in any quantity convenient for you, from pints to 54-gallon drums. Order from your United Motors Service distributor today.

A GENERAL MOTORS PRODUCT — A UNITED MOTORS LINE

DISTRIBUTED BY WHOLESALERS EVERYWHERE

moraine products

DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

H-540/V-8, the *Advanced Design* bus engine

Superior Coach School Bus
Installation view of H540. Compact, the 200-hp H540 can be installed longitudinally. Costly right-angle drive is eliminated.

Dependable Power

...that's why Superior Coach chooses Le Roi 200-hp H540/V-8

gets extra performance, extra economy

CHILDREN are a valuable cargo. That's why Superior Coach insists on the most reliable power plant it can get for its large school busses.

The Le Roi 200-hp H540 is just such an engine. It provides unmatched acceleration — acceleration that gets you out of trouble in a hurry, provides that additional margin of safety. But, there are many other reasons for using the H540: (1) It's the finest high-compression, valve-in-head V-8 engine for heavy-duty bus and truck applications. (2) It's only 45" long — that's 14" shorter than an equivalent six-cylinder engine. (3) It's easy, more economical to install — it's so compact that it can be mounted longitudinally, thereby eliminating a costly right-angle drive. (4) It has a weight-to-horsepower ratio of only six lbs. per hp. (5) It's just the engine for you — its advanced design provides vibration-free smoothness, the utmost in flexibility and economy, and greater ease of servicing.

Learn more about the remarkable H540/V-8 with its generous 200-hp. Write for our latest bulletin.

LE ROI

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
3716 W. Wisconsin Ave. • Dept. BT74 • Milwaukee 11, Wisconsin

Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Mich.

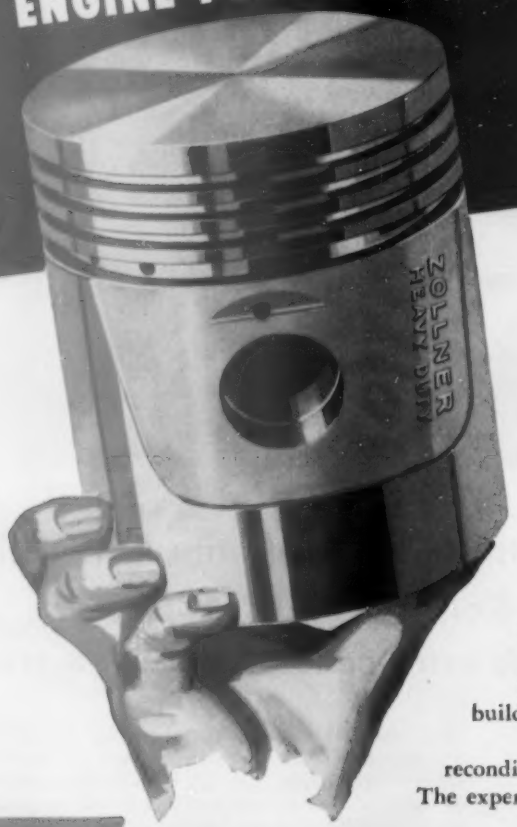
E-95

CUTS MAINTENANCE COST

STEPS UP ENGINE PERFORMANCE

Always Specify THE "ENGINEER APPROVED" PISTON

Used and recommended by over 70% of all Truck and Bus Manufacturers



The right piston for overhaul jobs is as vitally important as the right piston for original equipment. Be safe and sure by following the recommendation of your engine designer. Zollner Pistons are the expert product of hand-in-hand engineering development with engine builders! You can always depend on utmost performance and economy of operation when you recondition with Zollner "Engineer Approved" Pistons. The experience records of fleet owners, everywhere, prove Zollner the "best buy," always.

ZOLLNER

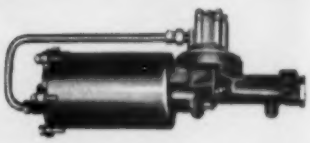
HEAVY DUTY PISTONS

ZOLLNER MACHINE WORKS • FORT WAYNE, INDIANA

Made By
MIDLAND
MEANS
MADE BETTER!

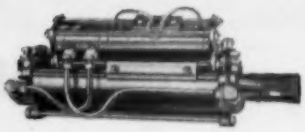
World's Largest Manufacturer of Automobile and Truck Frames Makes Complete Line of Superior Power Brake Equipment and Door Controls for Trucks, Tractors, Trailers, Buses, Passenger Cars

Midland Vacuum Hy-Power—for many years the choice of truck and bus operators and now available for passenger cars — converts ordinary hydraulic brakes into *power brakes.* Simple to install, compact, rugged construction, dependable. Positive braking under all conditions of road or weather.



Midland Air Hy-Power the original air-over-hydraulic power brake system—is still the finest, simplest, most dependable of its type. Provides air operation of tractor by hydraulic brake and control of trailer air brakes by standard hydraulic master cylinder. Lightning fast action, fewer parts, less weight. Sealed against the elements.

Midland Air Compressors offer patented automatic inlet valves built into the cylinder head for greater efficiency, cleaner air, cooler operation, simpler installation. Available in 7.4 and Model 12 capacities. Provide ample reserve braking power for the worst traffic emergencies.



Midland's complete door control equipment for buses includes every type of valve, switch, signal and connection required for safe, dependable, efficient operation. Systems available in both Straight-Air and Electro-Pneumatic operation. For years the choice of leading bus manufacturers. Time-proved the best by every test!

Whether you're a manufacturer or an operator of automotive equipment, you'll profit by insisting that your power brakes, compressors, and door controls be made by Midland. Complete information by writing the factory or through contacting your nearest Midland Distributor.

THE MIDLAND STEEL PRODUCTS CO.
3641 E. MILWAUKEE AVE. • DETROIT 11, MICH.
Export Department: 38 Pearl St., New York, N. Y.

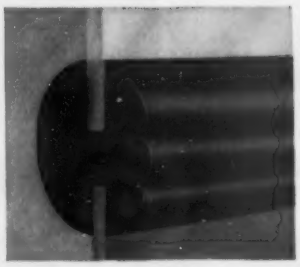
FABRICATED PARTS AND STAMPINGS FOR ANY PRODUCT!

What do we mean...*this* prevents leaks?

Well, it *does*... in windshields and fixed windows!

Here's how it works!

One of the simplest forms of Inland Self-Sealing Weather Strip is shown here. The Strip goes into the body panel or other opening. Then the glass goes into the Strip. Then the over-size filler strip goes into the locking channel, expanding it, compressing the whole Inland Self-Sealing Weather Strip into a complete and permanent leak-proof seal!



It's a cross-section view, greatly enlarged, of Inland Self-Sealing Weather Strip specially designed and fabricated for a particular window application.

Inland Self-Sealing Weather Strip . . . and *only* Inland Strip . . . does just that. For we *originated* the idea . . . resilient rubber, permanently compressed, making a water-tight seal without cement or binders. A seal which assures permanent and complete leak-proofing. Only Inland can supply it!

Look at the diagram! See just how Inland Strip works. It uses less material, permits fast installation, cuts costs. It's *best* for the vehicle manufacturer, *best* for the user . . . giving safer driving, longer service, lower glass-replacement cost.

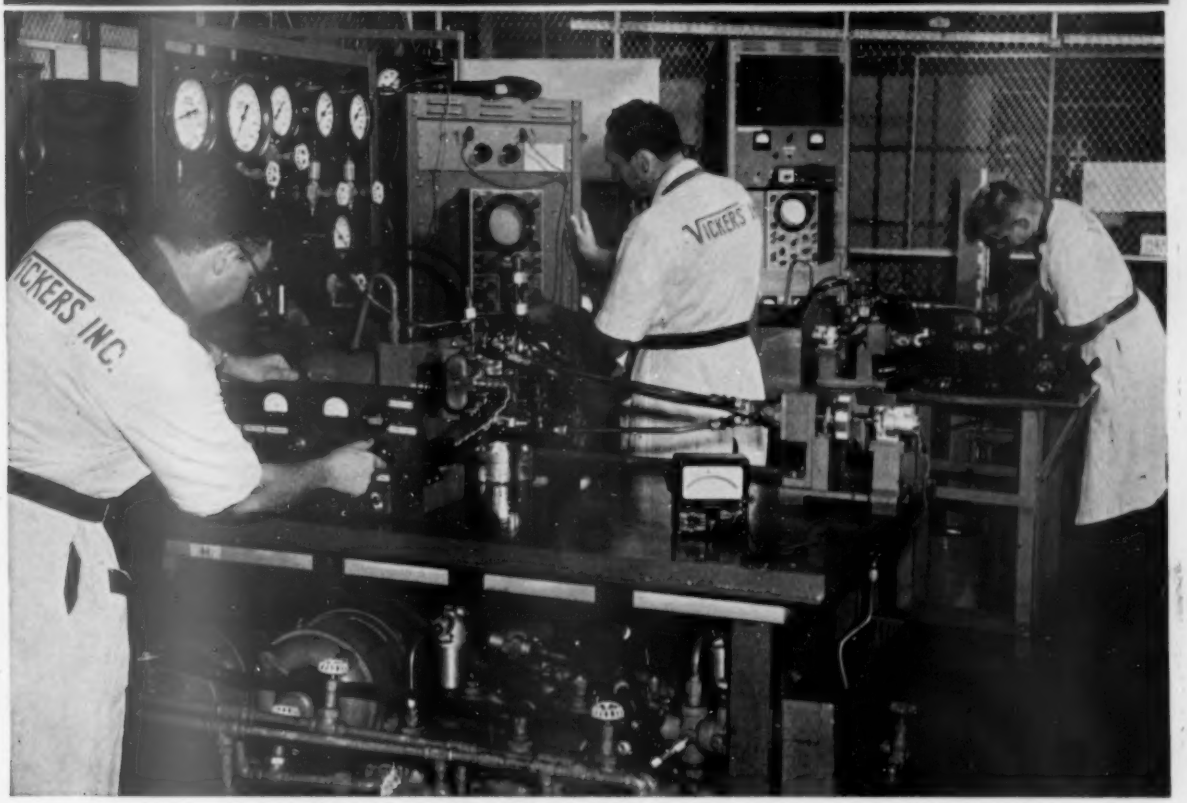
INLAND MANUFACTURING DIVISION
General Motors Corporation • Dayton, Ohio

INLAND MANUFACTURING

Self-Sealing WEATHER STRIP

ONE OF A SERIES

You Get Many Benefits
by Specifying VICKERS® Hydraulics



Research | that means improved oil hydraulic equipment

The list of pioneering developments in hydraulics contributed by Vickers research is long and impressive. Among the most important are:

Hydrostatic Relief Valve • Commercial Power Steering • Balanced Vane Type Pump • Flow Control Compensator • Axial Piston Pump and Motor

These are fundamental developments that have been of vital importance in the progress of hydraulics. They are representative of a large line of equipment that, with Vickers experienced application, assures you the best in any type of hydraulic operation. Vickers, with unmatched laboratory and basic research facilities, continues to lead the way in the oil hydraulics industry.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

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TROPIC-AIRE

and Continental

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A Diesel-Powered Motor Coach Air Conditioner

After more than a year of development in conjunction with Continental Motors Corporation, Tropic-Aire—Carrier offers the motor coach industry an entirely new concept in mobile air-conditioning equipment . . . *diesel power!* The new lightweight Continental diesel engine is utilized with air conditioning units of 5 or 7½ tons capacity. It eliminates the need for additional fuel tank and separate fuel supply, avoids the hazards of gasoline, and reduces operating costs to a point far below the cost of gasoline operation! Common fuel supply reduces weight to a minimum, too. Servicing is easier and more efficient, especially where mechanics have become more specialized and skilled in diesel maintenance.

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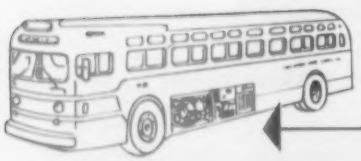
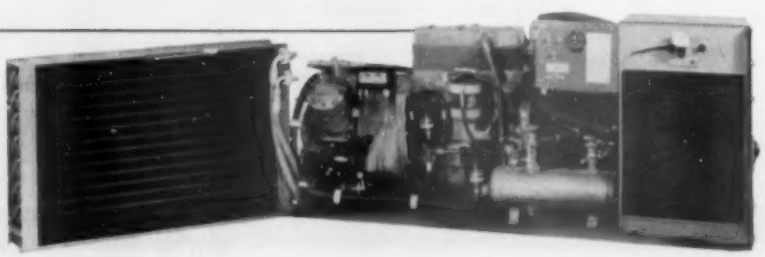
Inc., 5201 W. 65th STREET • CHICAGO 38, ILL.

TROPIC-AIRE, INC., IS A SUBSIDIARY OF McGRAW ELECTRIC CO., CHICAGO





Further information upon request

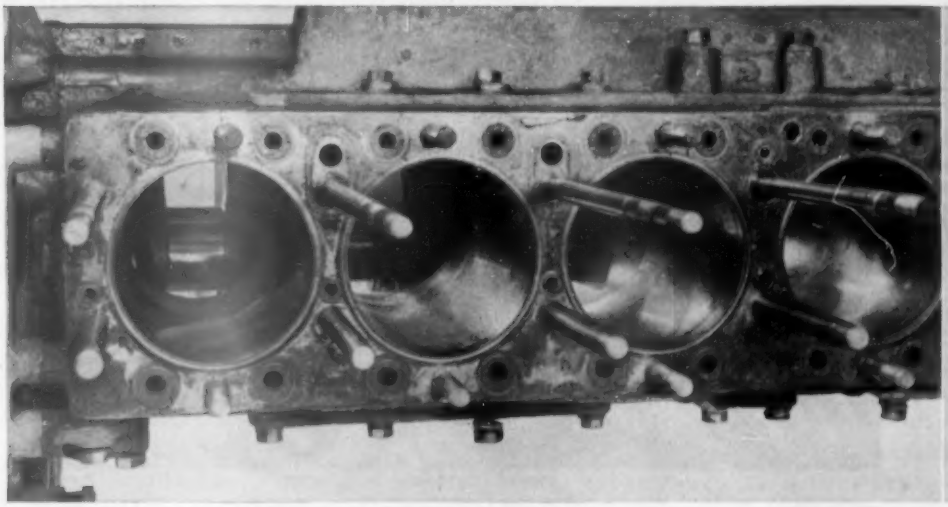
The Engineer's Report

CASE HISTORY

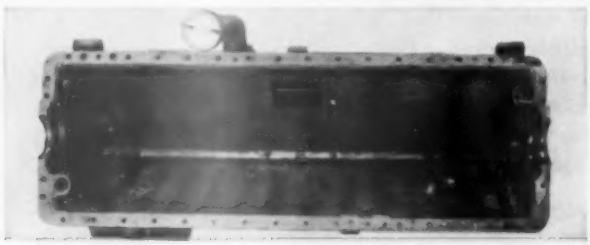
LUBRICANT RPM Delo Oils

FIRM Boise-Winnemucca Stages Inc., Boise, Idaho

Cylinder wear only 0.006″ after 228,413 miles!



USING RPM DELO SPECIAL LUBRICATING OIL, this 180-H.P. Fageol engine went 228,413 miles without repairs of any kind, in a bus owned by Boise-Winnemucca Stages, Inc. It ran in intense summer heat and sub-zero winter temperatures on the line's regular route. Wear on cylinders measured only 0.004" to 0.006" and crankshaft journals were still factory standard. All rings were free, all bearings good and pistons showed no varnish. There was no measurable wear on crankshaft or wrist pins.



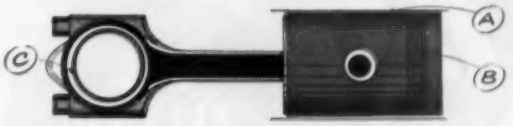
REMOVED FOR FIRST TIME, oil pan shows no deposits, clean metal is visible after draining. RPM DELO Oils reduce wear and keep engines clean in all of the buses owned by Boise-Winnemucca Stages.

FREE FOLDER tells you about all the RPM DELO Oils and how they meet every heavy-duty engine condition. Write or ask for it today.

FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.

RPM DELO LUBRICATING OILS

How RPM DELO Oils reduce wear, corrosion, oxidation in all heavy-duty engines



A. Contain special additives that provide metal-adhesion qualities...protect parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring sticking. Detergent keeps parts clean...helps prevent piston scuffing.

C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF

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THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

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YOUR ENGINES NEED THE EXTRA PROTECTION OF AC OIL FILTERS

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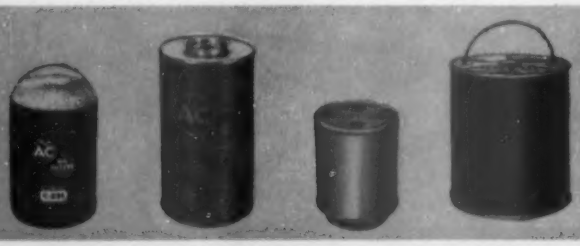
AC OIL FILTER ELEMENTS

A BETTER ELEMENT FOR NEARLY EVERY MAKE OF FILTER



AC SPARK PLUG DIVISION GM GENERAL MOTORS CORPORATION

FINANCIAL AID TO HIGHER EDUCATION

What Business Can Do to Help Our Colleges and Universities

Is the financial squeeze now gripping our colleges and universities grave enough to warrant direct action by the business community? If so, what can business do about it? This editorial is addressed to these two questions.

In the previous editorial in this series of two, it was demonstrated that **our colleges and universities, and particularly the independent institutions, face financial difficulties, which, unless relieved, promise to get progressively worse and might ultimately result in a national disaster.** This state of affairs obviously gives the business community a crucial stake in helping to relieve the plight of these institutions. For our business organizations can be no stronger than the total community of which they are a part.

It does not follow automatically, however, that every business firm should give direct financial aid to education. Already the business structure is heavily burdened with activities unrelated to its main purpose. These include acting as tax collector for more than $65 billion of federal, state and local taxes in the year 1953. There is a limit to the amount of such public enterprise that can be loaded on the business system.

Business Holds Key to Answer

If, however, the survival of a key part of our educational system depends on its having financial help from the business community, that help should be provided. And this is the situation of our independent privately endowed colleges and universities.

Of course, our tax-supported institutions of higher learning must also be kept strong, financially and otherwise. But they have recourse to public support not available to the independent institutions. Largely on this account, their present financial difficulties are much less acute than those of the independent colleges and universities.

These independent institutions have seen price inflation eat away much of the value of their endowments. Moreover, there is no prospect that these endowments can be sufficiently replenished by gifts from the wealthy people who provided them in earlier years. Progressive income and estate taxes have seen to that. Thus, they are faced not only with a peculiarly acute financial problem, but also one which cannot be solved except by tapping other sources of aid.

Tax Support No Solution

It is conceivable that the independent colleges and universities might solve their financial problem by seeking support from tax revenues. If they did this, however, they would lose their distinctive character as independent institutions, and our system of higher education would lose one of its major elements of strength. That is the existence in our educational system of both independently financed and tax-supported colleges and universities. Each has its special contribution to make to a well-balanced system of higher education.

Business is directly dependent upon higher education to staff its increasingly complex and exacting operations. A key part in this process is played by the small, independent liberal arts colleges which are the hardest hit financially of all our institutions of higher learning. "These," states the Council for Financial Aid to Education, recently formed by a group of business leaders, "have contributed a high proportion of the intellectual, scientific and religious, as well as business leadership of the nation. Their programs are devoted to the teaching of values, particularly the values of freedom. They are a vital bulwark to our system of free enterprise."

Means of Providing Help

There are many means by which business firms can extend help to our colleges and universities. The most obvious, of course, is to make outright grants of money either to individual institutions or to groups of institutions for such uses as the institutions think best. Another means of help, increasingly employed by business firms, is to establish scholarships to pay the full cost of college or university courses of study. Sometimes the scholarships are open for general competition, sometimes they are limited to employees and children of employees of the firm granting them. Not infrequently those winning the scholarships spend some part of their school vacations working in the companies granting the scholarships.

A number of companies have recently provided for what have come to be called "scholarships in reverse." These companies pay a flat sum to a college or university for every one of its graduates they employ. Financing of university research programs also offers a broad avenue for financial aid to our universities by business.

Need Two-Way Communication

Some business firms have well-developed programs for financial aid to education. But they are exceptional. For most companies the problems involved are new and strange. These companies were created with the basic purpose to make money, not to give it away. Successful philanthopic operations involve a whole set of problems with which they have very little experience. Not the least of these is how to make business a dependable source of financial aid to education, since business has no assurance that the profits of one year will not be losses the next.

Considerations such as these emphasize the wisdom of a recent Industry-College Conference on aid to higher education by business, in making the first of its ten conclusions that "better communication, by direct contact, is needed for each [industry and the colleges] to understand the problems of the other." At this juncture the creation of mutual understanding is much more important than the raising of some money and letting it go at that. The problem of aid to education by business has its immediate urgency, but there is also a long-range program to be developed on which business and the colleges and universities must pull together in the years ahead to find a satisfactory solution.

As stated at the outset, failure to find a satisfactory solution could result in a national disaster. This means that, **to give proper heed to their own future prosperity and the future welfare of the nation, business firms generally must go to work on the problem of financial aid to higher education. They must go to work first, to understand the problem; second, to establish two-way communication with our colleges and universities about it; and third, to develop a program which pays proper heed to the needs and capabilities of both business and higher education.**

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

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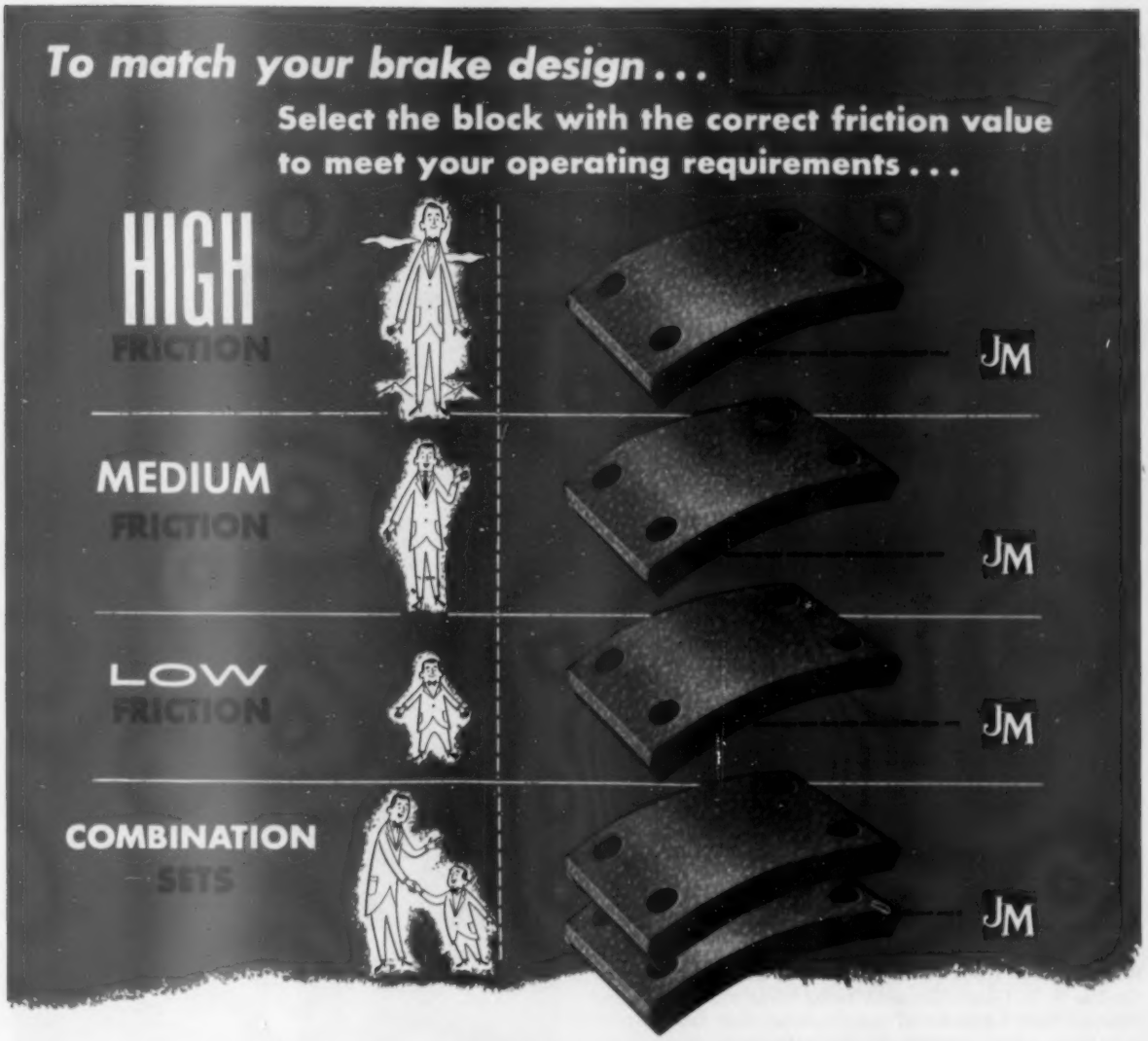

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JM Johns-Manville *asbestos* FRICTION MATERIALS

Dulux® is Central N.Y. Coaches' "War Paint"

. . . against rigors of the Mohawk

Where Indian trails once wound along the Mohawk River, Central N. Y. Coach Company today keeps a heavy schedule linking Utica, Little Falls, and Syracuse. Bus finishes must fight bitter winter weather and corrosive road salts as well as the wear and tear of heavy travel . . . must stay bright and colorful with minimum time in the paint shop. That's why Du Pont DULUX Enamel is the choice here—and has been for some 20 years!

In this time the company has found that they can rely on DULUX for tough finish beauty that keeps a shining-bright rich-color gloss year after year. They like the fast, easy way DULUX goes on, too—the way it flows out smoothly with high hiding, then dries to an even gloss that *needs no rubbing*.

Performance like this means less time in the shop—more time on the road. So take a tip from Central N. Y. Coach Company—put the "Indian" sign on costly overhead and keep your fleet looking its best with Du Pont DULUX Enamel. E. I. du Pont de Nemours & Co. (Inc.), Refinish Sales, Wilmington 98, Delaware.

JACK A. MURDIE, Superintendent of Equipment, sees how DULUX jobs go out of the shop fast . . . then stay out. Like so many other maintenance officials, he feels that DULUX is a big help in keeping tight operating schedules.

WALLACE S. SWEET, Secretary of CENTRAL N. Y. COACH LINES, INC., realizes how bright, attractive-looking equipment draws favorable attention and builds traffic volume. He knows it pays to specify DULUX enamel every time.

DU PONT **DULUX®** enamel

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HEAVY-DUTY LOXOCKETS give you POWER for toughest nut-turning jobs—SPEED and SAFETY, too!

Here's the set to have at hand when big, *really tough* nuts on trucks, buses, tractors demand large wrench size, powerful handle leverage and top working speed. Snap-on Heavy-Duty Loxockets give all three and *safety* as well! Through a special locking device, a pin in the handle square drive snaps into a locking hole in the socket. Only by depressing a release button incorporated in the socket can the locked units be released. Interchange of units is fast, simple and easy. Heavy-Duty Loxockets help get these working vehicles back on the job in less time—let your Snap-on man demonstrate them. For latest catalog of the complete line of Snap-on Tools, write

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are adjustable to different wheel base lengths without loss of lifting capacity

It's possible to lift every vehicle from small city transit buses to large transcontinental coaches on Weaver Twin Post Lifts.

These Lifts handle a wide range of wheel bases. For example, the Model EC-106 (illustrated) is electrically-operated and is regularly furnished with wheel base extension range of 102" to 204" unless otherwise specified.

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That's because Solex is a very special glass. It reduces sun glare, a major cause of discomfort to everyone—and keeps the bus interior cooler by reducing the amount of solar heat that enters the bus. Actually, Solex admits 70% to 75% of the total solar light, while absorbing up to 50% of the total solar heat. So you get more safety and comfort, and less eyestrain and fatigue.

You can have this added comfort and safety in your buses by specifying Solex in your new equipment and by beginning a planned program of replacement with Solex in your present buses. All the well-known types of Pittsburgh Safety Glass—Duplate, Duolite and Herculite—are available in green-tinted Solex. Pittsburgh Plate Glass Company, Room 4259, 632 Fort Duquesne Boulevard, Pittsburgh 22, Pennsylvania.

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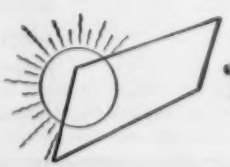
Solex is also available in Plate Glass for single glazing, as well as in Twindow—the window with built-in insulation. Because it reduces sun glare and shuts out up to half the existing solar heat Solex can make your offices and terminals more comfortable for working personnel and waiting passengers. See your Pittsburgh Plate Glass dealer.



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ABOVE: *Washable uniform of 90% "Orlon" and 10% rayon, made by Wirk Garment Division, Ligonier, Indiana*

Trim uniforms made with **ORLON** keep a neat look...at low cost

Courtesy gives passengers a good impression of your line. Neatly uniformed drivers help give a good impression, too. And drivers tell us uniforms made with "Orlon" stay neat . . . hold a press and retain a trim shape trip after trip—even through muggy weather. And these uniforms are in a class by themselves when it comes to easy, low-cost upkeep.

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Is really the coach of tomorrow . . .

1

2

1. Rear view of coach illustrating curved slanting rear window for greater vision and added safety.

2. View of left side of BECK DECK and HALF coach.

3. View of luxurious interior of BECK DECK and HALF coach showing comfortable recliners, drop floor aisle, modern lighting and ample inside baggage storage.

3

C. D. BECK & COMPANY,

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INC. *Sidney, Ohio*

1954 Buyer's Guide... *continued from page 53*

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National Carbon Co., E. 42nd St., New York 17, N. Y. ("Prestone" "Trek")
Penna. Refining Co., Cleveland 4, Ohio
Publicker Com'l Alcohol Co., Philadelphia, Pa.
*Socony-Vacuum Oil Co., 26 Broadway, New York, N. Y.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
U. S. Industrial Chemicals, Inc., 60 E. 42nd St., New York 17, N. Y.

ANTI-GASSERS

Baron Industries, 241 W. Ave., Los Angeles, Calif.
Bludalk, Inc., 404 West St., New York, N. Y.
*Fageol Co., R. D., Detroit, Mich.
*National Pneumatic Co., Boston, Mass.
*Zenith Carburetor Div., Bendix Aviation Corp., Detroit, Mich.

AXLES—See Shafts, Axle and Propeller

BATTERIES, STORAGE

American Bosch Corp., Sprigfield, Mass.
*Auto-Lite Battery Corp., Toledo 1, Ohio
*Bowers Battery & Spark Plug Co., Reading, Pa.
Carlile & Doughty, Inc., Conshohocken, Pa.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
*Electric Storage Battery Co., Philadelphia 32, Pa.
*Firestone Tire & Rubber Co., Akron 17, Ohio
General Tire & Rubber Co., Akron, Ohio
Globe-Union, Inc., Milwaukee, Wis.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron, Ohio
Gould Storage Battery Corp., Depew, N. Y.
Hicks Battery Co., Columbus, Ga.
Hobbs Battery Co., San Francisco, Calif.
*Kathanode Corp., St. Paul, Minn.
*Laher Battery Production Corp., 2619 Magnolia St., Oakland, Calif.
Prest-O-Lite Battery Co., Toledo, Ohio
Sonotone Corp., Elmsford, N. Y.
States Batteries Ltd., San Francisco, Calif.
Surrette Storage Battery Co., Salem, Mass.
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.
Vesta Consolidated, Inc., 400 W. Madison St., Chicago, Ill.
*Willard Storage Battery Div., Cleveland 1 Ohio
Witherbee Storage Battery Co., Hamburg Pa.

BATTERY TERMINALS—See Terminals

BEARINGS and BUSHINGS, BRONZE BRONZE-BACKED and DIE CAST

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Automotive Products Corp., Cincinnati 25, Ohio
Bunting Brass & Bronze Co., Toledo, Ohio
*Clevite Service Inc., Cleveland, Ohio
Detroit Aluminum & Brass Corp., Detroit 11, Ohio
Dura-Bond Engine Parts Co., Palo Alto, Calif.
*Federal-Mogul Corp., Detroit 13, Mich.
Gardiner Metal Co., 2514 W. 48th Pl., Chicago, Ill.
Johnson Bronze Co., New Castle, Pa.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Morris Co., J. Leslie, Los Angeles 33, Calif.
Phosphor Bronze Smelting Co., Philadelphia, Pa.
Thompson Products, Inc., Cleveland 3, Ohio

BEARINGS, BALL

Aetna Ball Bearing Mfg. Co., 4600 Schubert Ave., Chicago 39, Ill.
Ahlberg Bearing Co., 3025 W. 47th St., Chicago, Ill.
Ball & Roller Bearing Co., Danbury, Conn.
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Federal Bearings Co., Poughkeepsie, N. Y.
*Federal Mogul Corp., (Bower) Detroit, Mich.
General Motive Parts Co., 160 W. 62nd St., New York, N. Y.
Hoover Ball Bearings Co., Ann Arbor, Mich.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.
S.K.F. Industries, Inc., Philadelphia 34, Pa.
Torrington Co., Torrington, Conn.

BEARINGS, ROLLER

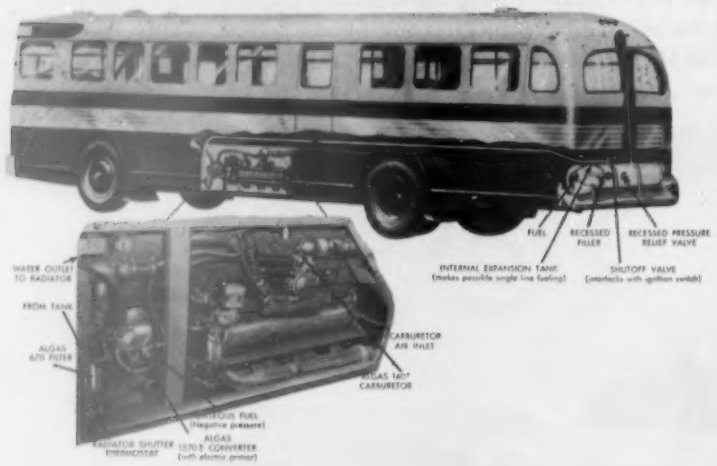
Bearings Co. of America, Lancaster, Pa.
Bantam Bearings Corp., South Bend, Ind.
Dura Bond Bearing Co., 715 Loma Verde Ave., Palo Alto, Calif.
*Federal Mogul Corp., (Bower)
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Orange Roller Bearing Co., Orange, N. J.
Raritan Bearing Corp., Trenton 4, N. J.
Roller Bearing Co. of America, Trenton, N. J.
Shafer Bearing Corp., 35 E. Wacker Dr., Chicago, Ill.
S.K.F. Industries, Inc., Philadelphia 34, Pa.
*Timken Roller Bearing Co., Canton 6, Ohio
Tyson Bearing Corp., Massillon, Ohio

BELLS and BUZZERS, PASSENGER SIGNAL—See Signals, Passenger Stop

BELTS, FAN

Asbestos Mfg. Co., Huntington, Ind.
Atlas Asbestos Co., N. Wales, Pa.
Continental Rubber Works, Erie, Pa.
Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
*Gates Rubber Co., Denver 17, Colo.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio

DOUBLE your engine life



with LP-GAS...the modern fuel

Thousands of truck owners and bus operators have found that LP-Gas is the answer to their engine overhaul problems. LP-Gas is a dry burning fuel that does not dilute the oil or cause washdown of cylinder walls. Case history after case history on trucks and busses have shown longer engine life, fewer oil changes, lower upkeep and *savings in fuel costs.*

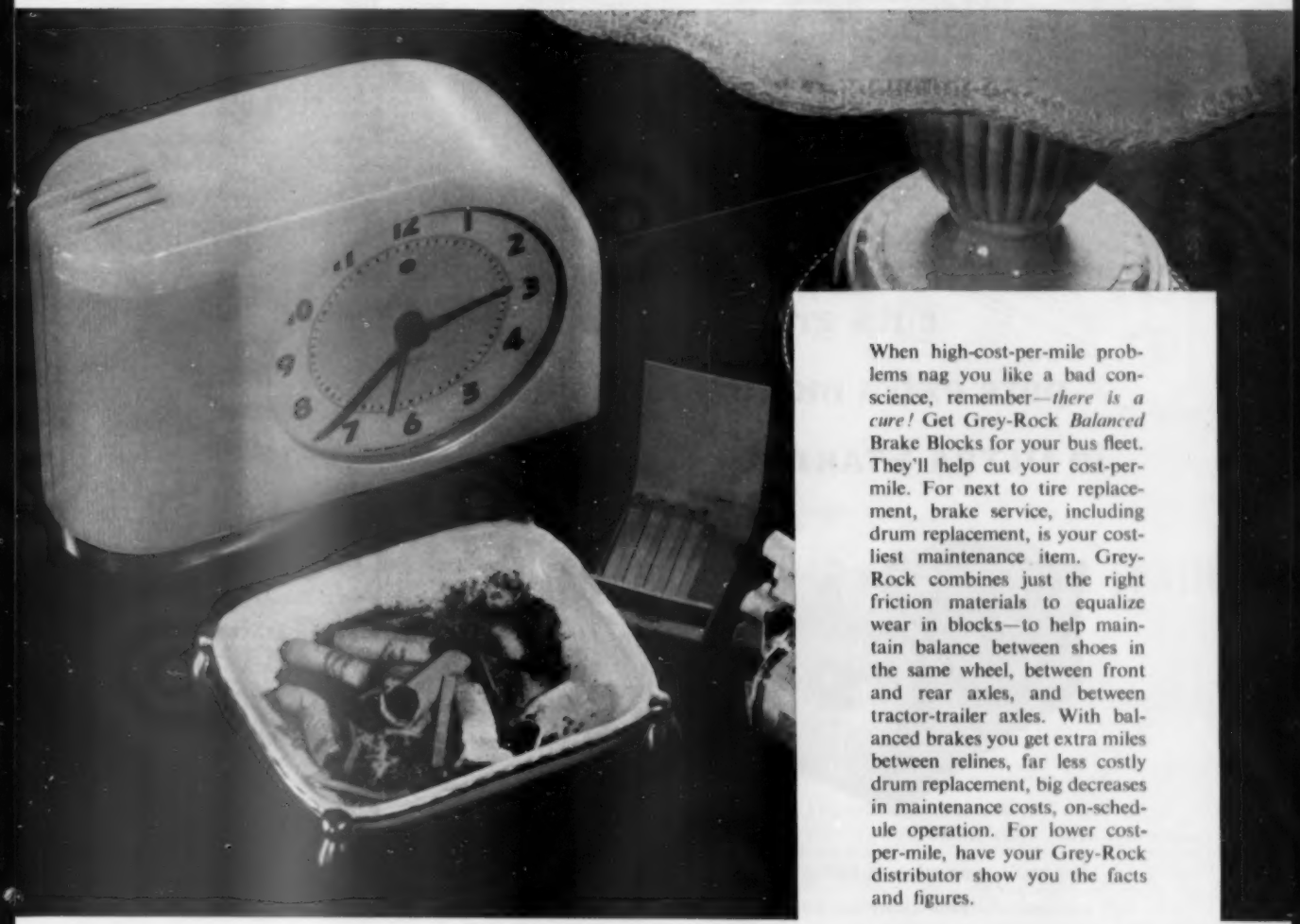
ALGAS 1570-E CONVERTER WITH ELECTRIC PRIMER

ALGAS 1600 MIXER

ALGAS is a pioneer in the LP-Gas field. We have engineered carburetion conversion equipment for the trucks or busses you own. Investigate the many advantages of LP-Gas today. Write now for our informative folder, "LP-Gas... the modern fuel."

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

"Half my fleet laid up for brake work— and you say quit worrying and go to sleep!"



When high-cost-per-mile problems nag you like a bad conscience, remember—*there is a cure!* Get Grey-Rock *Balanced* Brake Blocks for your bus fleet. They'll help cut your cost-per-mile. For next to tire replacement, brake service, including drum replacement, is your costliest maintenance item. Grey-Rock combines just the right friction materials to equalize wear in blocks—to help maintain balance between shoes in the same wheel, between front and rear axles, and between tractor-trailer axles. With balanced brakes you get extra miles between relines, far less costly drum replacement, big decreases in maintenance costs, on-schedule operation. For lower cost-per-mile, have your Grey-Rock distributor show you the facts and figures.

Best to STOP with...
Because they're best
to START with

Only **Grey-Rock** *makes*

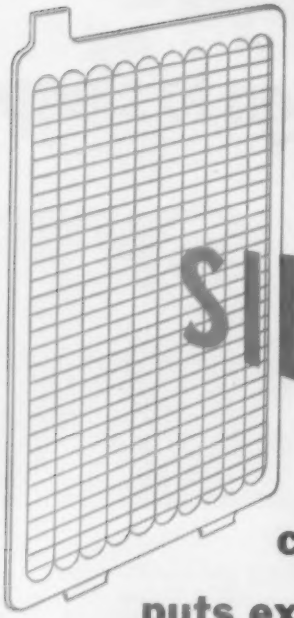
BALANCED BRAKSET LININGS

BALANCED BRAKSETS • TRUCKSETS • BRAKE BLOCKS • VEE-LOK® CLUTCH FACINGS

RM

GREY-ROCK DIVISION of Raybestos-Manhattan, Inc., **Manheim, Pa.**

RAYBESTOS-MANHATTAN, INC., Brake Linings • Brake Blocks • Clutch Facings • Fan Belts
Radiator Hose • Industrial Rubber, Engineered Plastic, and Sintered Metal Products
Rubber Covered Equipment • Asbestos Textiles • Packings
Abrasive and Diamond Wheels • Bowling Balls



SILVIUM®

cuts grid corrosion . . .

puts extra months and miles

in ULTRA START–LX Batteries!

EXIDE'S corrosion-fighting grid alloy, SILVIUM, puts an entirely new slant on how long a battery can really last! SILVIUM shackles the most destructive enemy of batteries—grid corrosion caused by overcharging. With SILVIUM, an Exide exclusive, the life of ULTRA START—LX® Batteries is multiplied. They give from 285 to 325 percent of S.A.E. Overcharge Life Test ratings.

No matter what batteries you're now using, start cutting your costs with Exide ULTRA START—LX. Get the facts today.

Exide AUTOMOTIVE DIVISION
THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2, Pa.
Exide Batteries of Canada, Limited, Toronto

Exide® BATTERIES

Graton & Knight Co., Worcester 4, Mass.
*Grey-Rock Div., Raybestos-Manhattan, Manheim, Pa.
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
Russell Mfg. Co., Middletown, Conn.
*Thermoid Co., Trenton, N. J.

BLOCKS, BRAKE—See Lining and Blocks, Brake

BOXES, FARE—See Registers and Devices, Fare Collecting

BRAKES, AIR, HYDRAULIC and VACUUM

Aireon Corp., Kansas City, Kan.
*American Chain & Cable Co., Auto & Aircraft Div., Detroit, Mich.
Auto Specialty & Mfg. Co., St. Joseph, Mich.
*Bendix Products Div. Bendix Aviation Corp., South Bend, Ind.
*Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio
Edelmann & Co., E. 2332 W. Logan Blvd., Chicago, Ill.
Empire Electric Brake Co., Newark 7, N. J.
Lambert Disc Brakes Div., Auto Specialties Mfg. Co., Hartford, Mich.
Lathan Co., San Francisco, Calif.
*Midland Steel Products Co., Detroit, Mich.
*Timken-Detroit Axle Co., Ashtabula, Ohio
*Vickers, Inc., Detroit 32, Mich.
*Wagner Elec. Corp., St. Louis 14, Mo.
Warner Electric Brake Mfg. Co., Beloit, Wis.
*Westinghouse Air Brake Co., Wilmerding, Pa.

BRAKES, AUTOMATIC ADJUSTERS

*Trucksville Brake Co., Trucksville, Pa.

BRAKE-FLUID—See Fluid, Hydraulic Brake

BRAKE DRUMS—See Drums, Brake

BUSHINGS—See Bearings and Bushings

BUZZERS—See Signals; Passenger Stop

CABINETS, FIRST AID—See Kits, First Aid

CABLE, IGNITION, STARTING, LIGHTING

American Enameled Magnet Wire Div. Electric Auto-Lite Co., Port Huron, Mich.
Belden Mfg. Co., 4689 W. Van Buren St., Chicago, Ill.
Caldwell Industries, Kent, Ohio
Crescent Co., Pawtucket, R. I.
*Electric Auto-Lite Co., Toledo 1, Ohio
General Electric Co., Bridgeport, Conn.
Kerite Co., 30 Church St., New York, N. Y.
Okonite Co., Passaic, N. J.
P & D Mfg. Co., Long Island City, N. Y.
*Packard Electric Div. General Motors Corp., Warren, Ohio
Rockbestos Products Corp., New Haven 4, Conn.
Standard Motors Products, Inc., Long Island City, N. Y.
Whitaker Battery Supply Co., Kansas City, Mo.
*Willard Storage Battery Co., Cleveland 1, Ohio

CARBURETORS

*American Liquid Gas Corp., Los Angeles Calif.
Bendix Products Corp., Stromberg Carburetor Div., South Bend, Ind.
Carter-Carburetor Corp., St. Louis 7, Mo.
Chandler Evans Co., Meridan, Conn.
Ensign Carburetor Co., Huntington Park, Calif.
Exola Products Co., Los Angeles 11, Cal.
Holley Carburetor Co., Detroit, Mich.
*Zenith Carburetor Div. Bendix Aviation Corp., Detroit, Mich.

CARDS, CAR

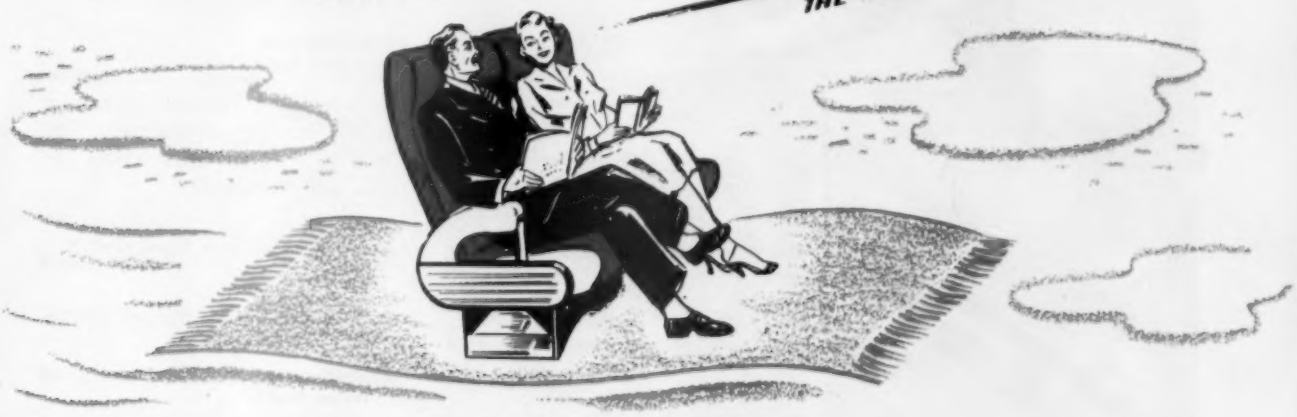
Car-Cards, Inc., 415 Lexington Ave., New York City, N. Y.
Chicago Car Advertising Co., 333 N. Michigan Ave., Chicago, Ill.
Loomis Advertising Co., St. Louis 1, Mo.
National Transitads, 400 N. Michigan Ave., Chicago, Ill.
Nation Wide Bus Advertising Inc., 220 E. 42 St., New York City, N. Y.

CASTINGS, CYLINDER SLEEVE (For Repairs)

Eagle Machine Co., Indianapolis, Ind.

A BIG Feature of The ROAD-RUNNER

THE NEW FITZJOHN INTERCITY COACH



The FITZJOHN "MAGIC CARPET" AIR-SUSPENSION SPRINGS

PASSENGERS FLOAT ON AIR

The brand new ROAD-RUNNER, soon to start rolling off the Fitzjohn production line, is a bus that's really going places — *and gives a "super-comfort" ride all the way!*

The new and revolutionary Fitzjohn "MAGIC CARPET" Air Suspension Springs will give passengers a thrilling, joltless, "floating-on-air" ride — while reducing vibration and shock on the bus, wear on the tires, *and reducing maintenance costs!*

This is only one of the many fine features of the ROAD-RUNNER — the Fitzjohn Intercity Coach completely new — from beak to tailfeathers! They all add up to: "Passenger-appeal" — maximum efficiency — lower maintenance costs — and money-making operation.

ON THE FITZJOHN ROAD-RUNNER IN 1954 — NOT 1960

Says BUSINESS WEEK (May 8, 1954): **"Another feature that may be on the 1960 passenger car is air suspension instead of springs.** Several companies have been working on it for several years. If the right materials with the right properties are developed, you may be riding on air in 1960." (Reproduced by permission of publishers)

DON'T BUY ANY BUS until you learn more about the bus industry's newest coach — "THE ROAD-RUNNER" — "coming at full speed" NEXT MONTH!

Send for photos and advance copies of specifications and learn more about the new FITZJOHN ROAD-RUNNER.

"The ROAD-RUNNER" is named after America's Most Versatile Bird

Just like its namesake—which can outrun a man or horse, displays wonderful maneuverability, makes quick stops when it senses danger, and needs little food or water—the ROAD-RUNNER is plenty fast to meet any need or schedule, is easy to manage, stops quickly and safely when there's danger ahead, and consumes less fuel—costing less to operate! Yes, it's—

A "BIRD" OF A BUS THAT'S GOING PLACES!

Builders of Fine Motor Coaches for More Than Thirty Years!

FITZJOHN COACH COMPANY
MUSKEGON, MICHIGAN

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Distribuidora de Omnibus Fitzjohn, S. A.
Ave. Morelos No. 83
Mexico City, Mexico

IN CUBA
Distribuidora de Omnibus Fitzjohn de Cuba, S. A.
E No. 310, esq. Calle 15
Vedado, Havana, Cuba

CANADIAN COMPANY—FITZJOHN COACH OF CANADA, LTD., Brantford, Ont.

"If it's made by Fitzjohn, it's made to make you money!"

NEW Precision made parts are necessary to restore worn shock absorbers to guaranteed dependable performance.

Practical economy-wise maintenance men are taking advantage of our fast reliable service.

All new parts are manufactured by us to obtain the high standards we employ in remanufacturing your shock absorbers. **Precision assembling assures dependable performance.** We are completely equipped and qualified by experience to render the prompt service you need. Send your worn shocks to us and save dollars.

National Transport Supply, Inc.

SHOCK ABSORBER, STARTER DRIVE AND WATER PUMP SERVICE

OFFICE AND PLANT

545 E. Hancock Detroit 1, Mich.

*Hunt Spiller Mfg. Corp., Boston, Mass.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Nitriliner Co., 4735 S. Talman Ave., Chicago 32, Ill.
*Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
*Toledo Steel Products Co., Toledo 1, Ohio

CEMENT, GASKET

Cabot, Inc., Samuel, Boston, Mass.
Durkee-Atwood Co., Minneapolis, Minn.
Hollingshead Corp., R. M. Camden, N. J.
Miller Mfg. Co., Camden, N. J.
Pep Mfg. Co., 33 W. 42nd St., New York, N. Y.
Permatex Co., Brooklyn 35, N. Y.
Stanley Co., John T., 642 W. 30th St., New York 16, N. Y.
Wilbur & Williams Co., Boston, Mass.

CHAINS, TIMING

Baldwin-Duckworth Div. Chain Belt Co., Springfield, Mass.
D & B Mfg. Co., 2335 S. Michigan Ave., Chicago 1, Ill.
Hoof Products Co., 6543 S. Laramie Ave., Chicago 38, Ill.
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.
Morse Chain Co., Ithaca, N. Y.
Whitney Chain & Mfg. Co., Hartford, Conn.

CHAINS, TIRE and ANTI-SKID

*American Chain & Cable Co., York, Pa.
Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
Cleveland Chain & Mfg. Co., Cleveland, Ohio
Columbus-McKinnon Chain Corp., Tonawanda, N. Y.
Hodell Chain Co., Cleveland, Ohio
International Chain & Mfg. Co., York, Pa.
McKay Co., Pittsburgh 22, Pa.
Peerless Chain, Winona, Minn.
Roll-O-Matic Chain Co., Kansas City, Mo.
Round California Chain Mfg. Co., So. San Francisco & Los Angeles 4, Cal.
Round Chain Mfg. Co., Chicago 6, Ill.
Seattle Chain Mfg. Co., Seattle 8, Wash.
Southern Chain & Mfg. Co., Birmingham 5, Ala.
Taylor Chain Co., S. G., Hammond, Ind.
Western Chain Prod. Co., 1809 W. Belmont, Chicago, Ill.
Woodhouse Chain Works, Trenton 7, N. J.

CHANNELS, FELT

American Felt Co., Glenville, Conn.
Armstrong Cork Co., Lancaster, Pa.
Booth Felt Co., Brooklyn, N. Y.
Felters Co., Boston, Mass.
Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.
Hamilton-Wade Co., Brocton, Mass.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Western Felt Works, 4117 Ogden Ave., Chicago 23, Ill.

CHANNELS, METAL

Cowles & Co., New Haven, Conn.
Kirk & Blum Mfg. Co., Cincinnati 25, Ohio
Motor Products Corp., Detroit, Mich.

CHANNELS, RUBBER

Bridgeport Fabrics, Inc., Bridgeport, Conn.
Dryden Rubber Co., 1014 S. Kildare Ave., Chicago, Ill.
*Inland Mfg. Co., Dayton, Ohio
Republic Rubber Div. Lee Rubber & Tire Corp., Youngstown, Ohio
Sponge Rubber Prod. Co., Derby, Conn.

CIRCUIT BREAKERS

Rohden Mfg. Co., 4739 Montrose Ave., Chicago 41, Ill.

CLAMPS, HOSE

American Stamping Co., Battle Creek, Mich.
*Breeze Corp., Newark, N. J.
Ideal Corp., 435 Liberty Ave., Brooklyn, N. Y.
Marman Products Co., Inglewood, Calif.
Murray Corp., Towson, Md.
National Utilities Corp., 826 S. Arroyo Parkway, Pasadena, Calif.
Screw Machine Products Co., Providence, R. I.
Tinnerman Products, Inc., Cleveland 13, Ohio
Universal Industrial Corp., Hackensack, N. J.
Washburn Co., Worcester, Mass.
Wittek Mfg. Co., 4305 W. 24th Pl., Chicago, Ill.

CLARIFIERS, OIL—See Filters, Oil

CLEANERS, AIR

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Air-Maze Corp., Cleveland 5, Ohio
Burgess Battery Co., 500 W. Huron St., Chicago, Ill.
Donaldson Co., St. Paul, Minn.
*Fram Corp., Providence 16, R. I.
Michiana Products Corp., Michigan City, Ind.
*Purolator Prod. Co., Rahway, N. J.
United Air Cleaner Co., 9705 Cottage Grove Ave., Chicago, Ill.
Vortox & Co., Claremont, Calif.

CLUTCHES—See Facings, Clutch

COILS, IGNITION

American Bosch Corp., Springfield, Mass.
Automotive Specialty Corp., Brooklyn, N. Y.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
DSM Electric Co., 6209 Hamilton St., Detroit, Mich.
Echlin Mfg. Co., New Haven 5, Conn.
*Electric Auto-Lite Co., Toledo 1, Ohio
Kem Mfg. Co., Fairlawn, N. J.
Mallory Electric Co., Detroit 4, Mich.
Niehoff & Co., C. E., 4925 W. Lawrence Ave., Chicago, Ill.
P & D Mfg. Co., Long Island City, N. Y.
Standard Motor Products, Inc., Long Island City, N. Y.

COLLECTORS, FARE—See Registers and Devices, Fare Collecting

COMMUNICATION—See Radio and Accessories, Mobile

COMPOUNDS, PARTS CLEANING—See Solutions, Parts Cleaning

COMPOUNDS, RADIATOR CLEANING

Hollingshead Corp., R. M. Camden, N. J.
Hygienic Products Co., Canton, Ohio
Lusk Co., C. F., Cleveland, Ohio
*Magnus Chemical Co., Garwood, N. J.
Magnuson Prod. Corp., Brooklyn, N. Y.
Miller Mfg. Co., Camden, N. J.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Penn Salt Mfg. Co., Philadelphia, Pa.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Radiator Specialty Co., Charlotte, N. C.

COMPOUNDS, UPHOLSTERY CLEANING

Fayette Chemical Co., Uniontown, Pa.
*Magnus Chemical Co., Garwood, N. J.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Sno-Flake Products Co., Detroit, Mich.

COMPOUNDS, VALVE GRINDING

*Carborundum Co., Niagara Falls, N. Y.
Clover Mfg. Co., Norwalk, Conn.
Pep Mfg. Co., 33 W. 42nd St., New York 18, N. Y.
Zip Abrasive Co., Cleveland, Ohio

COMPOUNDS, WASHING—See Soap & Detergents

CONSULTING SERVICE — See Management

CONTROLS, CHOKE

Arens Controls, 2550 S. Halsted St., Chicago, Ill.
*Bendix Products Corp., Stromberg Carburetor Div., South Bend, Ind.
Pierce Governor Co., Anderson, Ind.
Shakespeare Products Co., Kalamazoo, Mich.

CONTROLS, DASH

Arens Controls, 2550 S. Halsted St., Chicago, Ill.
Imperial Brass Mfg. Co., 1220 W. Harrison St., Chicago 7, Ill.
Richland Auto Parts Co., Mansfield, Ohio

CONTROLS, DOOR—See Operators, Pneumatic Door

CONTROLS, ENGINE HEAT—See Thermostats, Water Circulating—also Shutters, Radiator

CONTROLS, FUEL-FILLING

Modern Auto Supply Co., Syracuse, N. Y.
Protectoseal Co., 1958 S. Western Ave., Chicago 7, Ill.
*Scully Signal Co., Cambridge, Mass.

CORD, BELL & SIGNAL

Jessall Plastics, Inc., Hartford, Conn.
*Puritan Cordage Mills, Louisville, Ky.

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Acme Asbestos Covering & Flooring Co. 1300 W. Fulton St., Chicago 7, Ill.
American Mat Corp., Toledo, Ohio
Armstrong Cork Co., Lancaster, Pa. (Armoflor, Automat, Linoleum, Traffex)
Bird & Son, Inc., Walpole, Mass.
Congoleum-Nairn, Inc., Kearney, N. J. (Congoleum)
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron, Ohio
*Johns-Manville, 22 E. 40th St., New York 16, N. Y. (Composition)
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
*Mohawk Flexible Products Co., Akron 8, Ohio
*Moore & Co., Sam, Mantua, Ohio
Pabco Products, Inc., San Francisco, Calif.
R. C. A. Rubber Co., Akron, Ohio
Sloan, W. & J., 5th Ave. & 47th St., New York, N. Y. (Carpet)
Tuco Products Corp., 30 Church St., New York, N. Y. (Composition)
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y. (Rubber Matting)

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Ohio Crankshaft Co., Cleveland, Ohio
Permalux Co., 900 W. Lake St., Chicago, Ill.
Wyman Gordon Co., Worcester, Mass.

DECALCOMANIAS—See also Stencils

American Decalcomania Co., 4326-5th Ave., Chicago 24, Ill.
Excello Specialties Co., Cleveland, Ohio
*Meyercord Co., 5323 W. Lake St., Chicago 44, Ill.
Palm Bros. Co., Cincinnati 12, Ohio
Palm Fechteler & Co., 220 W. 42nd St., New York 18, N. Y.
Permalux Co., Aurora, Ill.

DEGASSERS—See Anti-Gassers

DESCALERS

American Sand-Banum Co., 9 Rockefeller Plaza, New York, N. Y.
Butler Engineering Co., New Orleans, La.
Electromotive Industries, Inc., Louisville, Ky.
Stanley Co., John T., 642 W. 30th St., New York 16, N. Y.

DIFFERENTIALS—See Gears, Differential

DOORS, AIR OPERATED—See Operators, Pneumatic Door

DRUMS, BRAKE

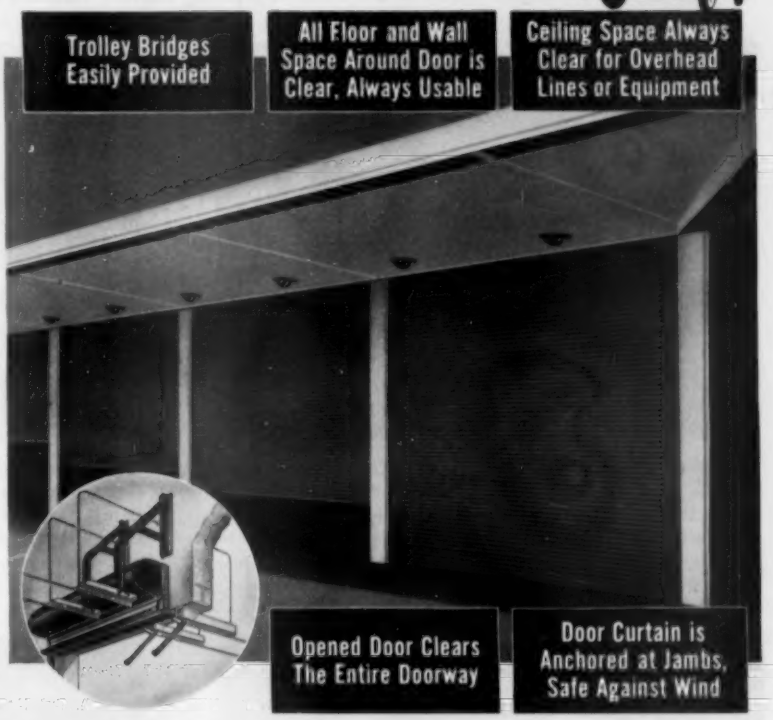
Christiana Machine Co., Christiana, Pa.
*Copperweld Steel Co., Glassport, Pa.
Dayton Steel Fdry. Co., Dayton 1, Ohio
Eaton Mfg. Co., Cleveland 10, Ohio
Erie Malleable Iron Co., Erie, Pa.
Frank Foundries Corp., Moline, Ill.
General Foundry & Mfg. Co., Flint, Mich.
*Gunite Foundries Corp., Rockford, Ill.
*Hunt-Spiller Mfg. Corp., Boston, Mass.
Lempco Products, Inc., Bedford, Ohio
Motor Wheel Corp., Lansing, Mich.
*Reynolds Mfg. Co., Springfield, Mo.
*Timken-Detroit Axle Co., Ashtabula, Ohio

ENAMEL—See Paint, Enamel and Lacquer

EXTINGUISHERS, FIRE

American-La France-Foamite Corp., Elmira, N. Y.
Ansul Chemical Co., Marinette, Wis.
AutoFyrstop Co., Philadelphia, Pa.
Bean Mfg. Co., John, Lansing, Mich.
Buffalo Fire Appliance Corp., Dayton, Ohio
C. O. Two Fire Equipment Co., Newark, N. J.
Fyr-Fyter Co., Dayton, Ohio
General Detroit Corp., Detroit 7, Mich.
Kidde & Co., Walter, Belleville 9, N. J.
National Fire Extinguisher Co., 50 Rockefeller Plaza, New York 19, N. Y.
*Pyrene Mfg. Co., Newark 8, N. J.
Randolph Laboratories, Inc., 8 E. Kinzie St., Chicago 11, Ill.

Friendly to bus traffic *in any building*


Trolley Bridges Easily Provided
All Floor and Wall Space Around Door is Clear, Always Usable
Ceiling Space Always Clear for Overhead Lines or Equipment
Opened Door Clears The Entire Doorway
Door Curtain is Anchored at Jambs, Safe Against Wind

Kinnear Steel Rolling Doors

You don't have to "stand clear" when you open a Kinnear Rolling Door. You can park within inches of its interlocking steel slat curtain, inside or outside the building – or on both sides – without blocking door action. Because Kinnear Rolling Doors rise straight upward and coil compactly above the opening.

In fact, you can make full use of all floor, wall and ceiling space around Kinnear Rolling Doors at all times, for equipment, materials, conveyors or structural members. No reserve space is needed for door operation.

You also clear *the entire opening* every time you raise a Kinnear Rolling Door all the way. No part of door projects into traffic's way.

Anchored in steel jambs at both ends, the Kinnear door curtain can't be slammed shut, blown open, or battered back and forth by wind.

Trolley bridges are also easily provided, to meet any requirement.

In addition, you get all-metal protection against fire, storms, intruders, or accidental damage in Kinnear Rolling Doors. They're built to save time, space, and maintenance costs through years of constant daily service, as proved through more than 50 years of use in all types of commercial, industrial, and public buildings. Write today for full details on Kinnear Steel Rolling Doors.

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Manufacturing Co.
FACTORIES:
3050-70 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

Which DeVilbiss spray booth is best for you?

Greater efficiency, improved working conditions, faster painting—these are the benefits you get with a DeVilbiss Spray Booth tailored to the needs of your shop

1. Traveling Spray Booth. For large fleets where schedules call for complete paint jobs for as many as 6 vehicles a day. In operation, booth straddles vehicle, moves laterally. Painters stand on built-in elevators, spray all surfaces. Requires only 1/5 the space of conventional spray booths. Offers extensive time and operational savings.

2. Water-Wash Exhaust Chamber. If you already have a fireproof room, you can easily convert it to spray painting by installing a DeVilbiss Water-Wash Exhaust Chamber. It quickly and efficiently exhausts paint fumes and overspray. Water screen traps paint particles, eliminates fire hazards.

3. Enclosed, Water-Wash Spray Booth. Two booths, back to back, are used here for appearance servicing and refinishing transit vehicles of all kinds. Manager reports: "A tremendous improvement in working conditions. General cleanliness inspires workers to take greater pride in their work. Not only is quality better but there is a 25% increase in production."

4. Economy Spray Booth. Ideal for small or medium-sized fleets. Ample flow of clean air carries away fumes and vapors for healthful, safe working conditions. Scientifically lighted for close masking, stenciling, lettering, etc. Standard panel sizes provide easier erection, lower installation costs. Available with dry or water-wash type exhaust.

These are a few of the DeVilbiss Spray Booths available with many variations to fit your needs. Your DeVilbiss jobber can give you complete details on these units or on DeVilbiss Spray Guns, Air Compressors, Transformers, Hose and Connections. Call him today, or contact our branch office or factory.

THE DEVILBISS COMPANY, Toledo, Ohio

Barrie, Ontario • London, England • Santa Clara, Calif.

Branch Offices and Distributors in Principal Cities Throughout the United States, Canada and the World

FOR BETTER SERVICE, BUY

DEVILBISS

Safety First Prods. Corp., Elmsford, N. Y.
Will-x Mfg. Corp., Brooklyn, N. Y.

FABRICATIONS—See Panels

FABRICS, UPHOLSTERY—See also Leather, Artificial

Burlington Mills Corp., 350 Fifth Ave., New York, N. Y.
Chicopee Mfg. Corp., 40 Worth St., New York 13, N. Y.
Collins & Aikman Corp., 200 Madison Ave., New York, N. Y.
*Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y.
Massachusetts Mohair Plush Co., 2 Park Ave., New York, N. Y.
Susquehanna Mills, Inc., 404 Fourth Ave., New York, N. Y.
Textileleather Corp., Toledo, Ohio

FACINGS and PLATES, CLUTCH

Accurate Parts Mfg. Co., Cleveland, Ohio
*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Borg & Beck Div., Borg-Warner Corp., 6558 S. Menard Ave., Chicago, Ill.
*Clevite Service Inc., Cleveland, Ohio
Fibre & Metal Products, Inc., Downey, Calif.
General Metals Powder Co., Akron, Ohio
*Grey-Rock Div., Inc., Raybestos-Manhattan, Manheim, Pa.
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Lipe-Rollway Corp., Syracuse, N. Y.
*Long Mfg. Div. Borg-Warner Corp., Detroit, Mich.
*Raybestos Div. Raybestos-Manhattan, Inc., Bridgeport, Conn.
Russell Mfg. Co., Middletown, Conn.
*Spicer Mfg. Div. of Dana Corp., Toledo, Ohio
*Thermoid Co., Trenton, N. J.
*Wagner Electric Corp., St. Louis 14, Mo.
Wellman Co., S. K., Cleveland, Ohio

FANS, VENTILATING

Continental Screw Co., New Bedford, Mass.
Corbin Screw Corp., New Britain, Conn.
Diehl Mfg. Co., Elizabeth, N. J.
*Evans Products Co., Detroit 27, Mich.
Excell Auto Radiator Co., 320 E. 21st St., Chicago, Ill.
Hans Industries, Edmund, Detroit 4, Mich.
Lydon-Bricher Mfg. Co., St. Paul, Minn.
Samson United Corp., Rochester, N. Y.
Sturtevant Div., Westinghouse Elec. Corp., Boston 36, Mass.

FASTENERS

American Screw Co., Providence, R. I. (Phillips)
Boots Aircraft Nut Corp., New Canaan, Conn.
Camloc Fastener Co., 420 Lexington Ave., New York, N. Y.
Cherry Rivet Div. Townsend Co., New Brighton, Pa.
du-Pont-Explosive Rivet Div., Wilmington, Del.
Dzus Fastener Co., Babylon, N. Y.
Elastic Stop Nut Corp., Union, N. J.
*Goodrich Co., B. F., Akron, Ohio
Huck Mfg. Co., Detroit 7, Ohio
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Russell, Birdsal & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Shakesproof, Inc., 2565 N. Beeler Ave., Chicago 39, Ill.
South Chester Corp., Philadelphia 2, Pa.
Standard Pressed Steel Co., Jenkintown, Pa.
Tinnerman Products Inc., Cleveland 13, Ohio
United-Carr Fastener Corp., Cambridge, Mass.

FILL-SIGNALS—See Signals, Fill

FILLINGS, SEAT—See Seats, Spring or Rubber Cushions for

FILTERS, LUBRICATING and FUEL OIL

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
American Bosch Corp., Springfield, Mass
*Bowser, Inc., Fort Wayne 2, Ind.
Briggs Clarifier Co., Washington, D. C.
Champion Laboratories, Inc., Meriden, Conn.
Cuno Engineering Corp., Meriden, Conn.
*DeLuxe Products Corp., La Porte, Ind.
Edde Mfg. Co., Milwaukee, Wis.
*Fram Corp., Providence 16, R. I.
Hastings Mfg. Co., Hastings, Mich.
Klemm Automotive Products Co., 1718 N. Damen Ave., Chicago, Ill.
Luber-Finer, Inc., Los Angeles 7, Calif.
Michiana Products Corp., Michigan City, Ind.
Motor Economy Products, Inc., 107 W. 36th St., New York 18, N. Y.
Oil Purifier, Inc., Oakland, Calif.
Olixir Products, Inc., Buffalo, N. Y.
Pick Mfg. Co., West Bend, Wis.
*Purolator Products, Inc., Rahway, N. J.
Rega Mfg. Co., Rochester, N. Y.
Skinner Purifiers, Inc., Detroit, Mich.
Walker Mfg. Co., Racine, Wis.
W G B Oil Clarifier, Inc., Kingston, N. Y.
Winslow Engineering Co., Oakland 8, Calif.
*Wix Corp., Gastonia, N. C.

FILTERS, ENGINE COOLANT

*Fram Corp., Providence 16, R. I.
Perry Co. Div. R. M. Hollingshead Corp., Camden, N. J.

FIXTURES and FITTINGS, LAMPS (Interior)

*ACF-Brill Motors Co., Philadelphia, Pa.
*Adams & Westlake Co., Elkhart, Ind.
Arrow Safety Device Co., Mt. Holly, N. J.
Columbus Metal Products, Inc., Columbus Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
*Guide Lamp Div. General Motors Corp. Anderson, Ind.
*Luminator, Inc., 120 N. Peoria St., Chicago, Ill.
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Rosen & Co., A. W., 1801 First Ave., New York, N. Y.
Visionator, Inc., 120 W. Peoria St., Chicago, Ill.

FLARES, FUSEES, HIGHWAY

Anther Force Oiler Co., Ft. Madison, Iowa
Arrow Safety Device Co., Mt. Holly N. J.
Bolser Corp., Cedar Falls, Iowa
Dietz Co., R. E., Syracuse, N. Y.
Economy Electric Lantern Co., Milwaukee 8, Wis.
Grote Mfg. Co., Bellevue, Ky.
K-D Lamp Co., Cincinnati, Ohio
Kilgove Inc., Westerville, Ohio
Kilbourn-Sauer Co., Fairfield, Conn.
Miro-Flex Co., Wichita, Kan.
Sparks Withington, Jackson, Mich.
U-C Lite Mfg. Co., 1050 W Hubbard St., Chicago 11, Ill.
U. S. Electric Mfg. Corp., 222 W. 14th St., New York 11, N. Y.

FLOORS, BUS—See Coverings, Floor

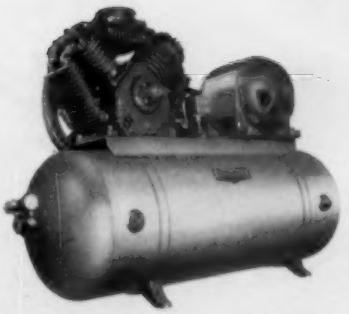
FLUID, HYDRAULIC BRAKE

Eis Automotive Corp., Middletown, Conn.
du Pont de Nemours & Co., E. I., Wilmington, Del.
*Moraine Prods. Div., General Motors Corp., Dayton, Ohio
Puritan Co., Rochester, N. Y.
*Wagner Electric Corp., St. Louis, Mo.
Warner Gear Div., Borg-Warner Corp. Muncie, Ind.

FUEL and LUBRICANTS

Atlantic Refining Co., Philadelphia, Pa.
American Oil Co., Baltimore, Md.
A. P. Parts Corp., Toledo, Ohio
Ashland Oil Refining Co., Ashland, Ky.
*Cities Service Co., 60 Wall Tower, New York, N. Y.
Continental Oil Co., Ponca City, Okla.
Ethyl Gasoline Corp., 100 Park Ave, New York, N. Y.
Freedom-Valvoline Oil Co., Freedom, Pa.
*Gulf Oil Corp., Pittsburgh 30, Pa.
Kendall Refining Co., Bradford, Pa.
MacMillian Petroleum Corp., Los Angeles, Cal.
Mid Continent Petroleum Corp., Tulsa, Okla.
New York & New Jersey Lubricating Co., 292 Madison Ave., New York, N. Y.
Ohio Oil Co., Findlay, Ohio
Penna Refining Co., Cleveland 4, Ohio
Pennzoil Co., Oil City, Pa.
*Phillips Petroleum Co., Bartlesville, Okla.
Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
Quaker State Oil Refining Co., Oil City, Pa.
Richfield Oil Corp. of N. Y., 19 W. 50th St., New York, N. Y.
*Shell Oil Co., 50 W. 50th St., New York 20, N. Y.
Skelley Oil Co., Kansas City, Mo.
*Socony Vacuum Oil Co., 26 Broadway, New York 4, N. Y.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.



New DeVilbiss Air Compressor pays for itself

It's true. Many times a new DeVilbiss Air Compressor will actually pay for itself *out of power savings alone!* DeVilbiss Air Compressors give you up to 22.6% more air per power dollar. You gain, too, in lower maintenance and depreciation costs. If you have a compressed air problem, contact your local DeVilbiss jobber today.

Every DeVilbiss Air Compressor, from ½ to 15 hp., offers you: A Dependable DeVilbiss Compressor Unit, Check Valve Manifold, Automatic Pressure Switch, Quality Electric Motor or Gas Engine, A.S.M.E. Tank, Outlet Manifold and Quiet Efficiency V-belt Drive.

THE DEVILBISS COMPANY
Toledo, Ohio

Santa Clara, Calif. • Barrie, Ontario • London, England
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY
DEVILBISS

We torture bus axles to

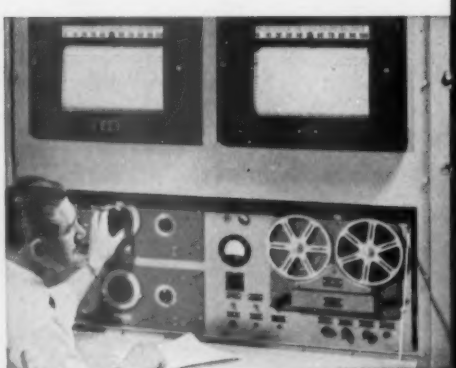
in the new Timken-Detroit indoor proving ground ...and only Timken has it!

We shock-load, abuse, and torture them. Match every conceivable hauling condition. Then add a few brutal tricks of our own!

Why? So you'll know in advance, and *for sure*, that a Timken-Detroit axle can take the punishment it was designed for. More rugged, grueling punishment than any other axle made!

To prove it, we capsuled a multi-thousand acre proving ground into one room. Here our engineers can put 50 years of experience in building axles for trucks, buses and trailers to work—subjecting axles and gearing *indoors*, to any *outdoor* operating condition.

Such exacting research pays off for you in: longer axle life; less maintenance, repairs and downtime; reduced operating expenses. This is why Timken-Detroit axles are preferred by manufacturers and operators everywhere.



How TDA proves axle quality in this "Torture Chamber"

We pick one of our axles at random . . . then duplicate a driving condition, hour after hour, day after day . . . simulating half a million miles of the toughest driving situations in just a few days. Or "invent" a test like going uphill with a full load from California to New York nonstop. There is no other axle testing like it in the world!

This is our "bus driver." He works in our "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . a heavily loaded bus in congested areas . . . then on a level express highway or long grade. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!

Tots and teens must get to school . . . safely, comfortably. That's why Timken-Detroit axles are *vital!* So rugged we can take a TDA axle shaft in our indoor proving ground and twist it 14° back and forth, 36 times a minute, 24 hours a day, week after week! Or simulate the punishment an axle housing would get, hitting a chuck hole with capacity load every 4 seconds, day and night—for months! Real assurance of dependability!

Intercity buses won't make a cent sitting in the shop. That's why Timken-Detroit axles get the nod from successful operators. Why? Because they've been "torture-tested" in our indoor proving ground—like simulating a nonstop, uphill run with full load at "X m.p.h." from New York to California! In fact we can duplicate your toughest schedules, winter or summer, day after day . . . proof that Timken-Detroit axles cost less to maintain.

death

Specify Timken-Detroit axles with Hypoid gearing

Hypoid gearing for bus axles was pioneered by Timken-Detroit. Proved in billions of ton-miles of actual operation. Designed to give the slower gear ratios necessary for modern engines without loss of strength. Pinion is bigger, stronger . . . bearings are larger . . . more teeth in contact reducing loading per unit of contact area. Torque transmitting capacity increased to step up performance and rugged power.

You get TDA brakes, too!

Every Timken-Detroit bus axle is equipped with Timken-Detroit brakes. So, when you specify "Timken-Detroit" on your new rubber-tired equipment you *know* you're getting the low-cost operating combination that's the "Accepted Standard" of the industry. Make sure every new transit vehicle you buy is Timken-Detroit axle-equipped!

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted TDA Standard
TRADE MARK REGISTERED

"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

Increase axle life with Genuine TDA Original Equipment Parts

Take no chances with ordinary replacement parts. For sure, dependable factory-type jobs, look to genuine Timken-Detroit axle parts kits—identical to original equipment.

Each kit is *complete*—gives you everything you need—in one handy package. Gaskets and shim parts, brake liners, steering knuckles, differential gears—for every size of brake and axle. Cut labor and adjustment costs to a minimum. Get your buses out of the shop and back on the road far quicker!

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

Torque CONVERTERS

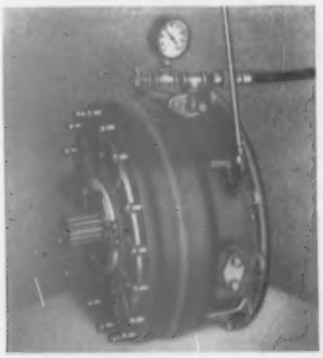
FIND OUT FOR YOURSELF HOW **TRANS-MAIN** SAVES TIME AND MONEY!

If you're sincerely interested in eliminating torque converter headaches, Trans-Main wishes to make this suggestion:

Send one of your converters to us—right away!

We will completely disassemble it. Then we will furnish you promptly with an itemized estimate of the cost to repair and recondition it, using proven methods and materials developed and employed exclusively by Trans-Main craftsmen.

These figures will enable you to easily compute your savings in time and money. We're sure you'll find our service worth-while . . . if not, your converter will be packed and returned, freight prepaid. A-9651



Static pressure testing of torque converter hydraulic section — a standard Trans-Main procedure.

Ask for copies of "Transit Maintenance Topics," a service bulletin containing the latest transit maintenance news.

TRANS-MAIN CORPORATION KENT, OHIO

Kent, Ohio

TRANS-MAIN

CORRORATION

Division of R. D. Fageol Co'

Sonneborn & Sons., Inc., L., 88 Lexington Ave., New York, N. Y.
*Standard Oil of Cal., San Francisco, Cal.
*Standard Oil Co. (Ind.), 910 S. Michigan St., Chicago 80, Ill.
*Sinclair Refining Co., 600 Fifth Ave., New York, N. Y.
Standard Oil Co. of N. J., 26 Broadway, New York 4, N. Y.
Sun Oil Co., Philadelphia, Pa.
*Texas Co., 135 E. 42nd St., New York 17, N. Y.
*Tidewater Associated Oil Co., 17 Battery Pl., New York, N. Y.
Union Oil Co., Los Angeles, Calif.
Warren Refining & Chemical Co., Cleveland 15, Ohio
Waverly Petroleum Products Co., Philadelphia, Pa.
Wolfs Head Oil Refining Co., Oil City, Pa.

FUEL ADDITIVES & SUPPLEMENTS—See Supplements, Fuel

FUSE-PANELS—See Panels, Fuse and Junction Blocks

FUSES

Commercial Enclosed Fuse Co., Hoboken, N. J.
Ero Mfg. Co., 714 Monroe St., Chicago, Ill.
Littlefuse, Inc., 4757 Ravenswood Ave., Chicago 40, Ill.
Pierce Renewable Fuses, Inc., Buffalo 7, N. Y.

GASKETS

Advance Packing & Supply Co., 618 W. Adams St., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Bridgeport Fabrics, Inc., Bridgeport, Conn.
Chicago Rawhide Mfg. Co., 1301 N. Elston St., Chicago 22, Ill.
Continental-Diamond Fibre Co., Newark, Del.
Felt Products Mfg. Co., 1507 Carroll Ave., Chicago 7, Ill.
Fitzgerald Mfg. Co., Torrington, Conn.
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Keasby & Mattison Co., Ambler, Pa.
McCord Corp., Detroit, Mich.
Peck Corp., B. G., Lawrence, Mass.
Vellumoid Co., Worcester, Mass.
Victor Mfg. & Gasket Co., 5750 W. Roosevelt Rd., Chicago, Ill.
Wilmington Fibre Specialty Co., Wilmington, Del.

GEARS, DIFFERENTIAL

Carpenter Gear & Engine Co., Pittsburgh, Pa.
*Clark Equipment Co., Buchanan, Mich.
Eaton Mfg. Co., Cleveland 10, Ohio
Foote Bros. Gear & Machine Corp., 5313 S. Western Blvd., Chicago 9, Ill.
Lempco Products, Inc., Bedford, Ohio
Micro Test Gear Co., Indianapolis, Ind.
New Process Gear Co., Syracuse, N. Y.
Perfection Gear Co., Harvey, Ill.
*Spicer Mfg. Corp., Toledo 1, Ohio
Thornton Tandem Co., Detroit, Mich.

GEARS, FLYWHEEL RING

Republic Gear Co., 2197 Beaufort, Detroit, Mich.
Automotive Gear Works, Richmond, Ind.
Lempco Products, Inc., Bedford, Ohio.
Logan Gear Co., Toledo, Ohio
New Process Gear Co., Syracuse, N. Y.

GEARS, STEERING

*Gemmer Mfg. Co., Detroit, Mich.
*Ross Gear & Tool Co., Lafeyette, Ind
Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich.
*Vickers, Inc., Detroit, Mich.

GEARS, TIMING

Republic Gear Co., Detroit, Mich.
Cloyes Gear Works, Cleveland, Ohio.
Continental-Diamond Fibre Co., Newark, Del.
D & B Mfg. Co., 2335 S. Michigan Ave., Chicago, Ill.
*Electric Auto-Lite Co., Toledo 1, Ohio
General Electric Co., Pittsfield, Mass.
Hoof Products Co., 6543 S. Laramie Ave., Chicago, Ill.

GEARS, TRANSMISSION

Automotive Gear Works, Richmond, Ind.
Carpenter Gear & Engine Co., Pittsburgh, Pa.
*Clark Equipment Co., Buchanan, Mich.
Covert Gear & Mfg. Co., Lockport, N. Y.
Dittmer Gear & Mfg. Corp., Lockport, N. Y.
Foote Bros. Gear & Machine Corp., 5313 S. Western Blvd., Chicago 9, Ill.
Fuller Mfg. Co., Kalamazoo, Mich.
Lempco Products, Inc., Bedford, Ohio
Lipe-Rollway Corp., Syracuse, N. Y.
Mechanics Universal Joint Div., Borg-Warner Corp., Rockland, Ill.
Muncie Gear Works, Muncie, Ind.
New Process Gear Corp., Syracuse, N. Y.
Perfection Gear Co., Harvey, Ill.
Republic Gear Co., 2197 Beaufort, Detroit, Mich.
*Spicer Mfg. Corp., Toledo 1, Ohio
Stolp Associates, Geneva, N. Y.
Warner Gear Div., Borg-Warner Corp., Muncie, Ind.

GENERATORS, AUTOMOTIVE

*Automotive Generator Service, St. Louis, Mo.
American Bosch Corp., Springfield, Mass.
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
*Electric Auto-Lite Co., Toledo, Ohio
*Leece-Neville Co., Cleveland, Ohio
Owens-Dyneto Div., Electric Auto-Lite Co., Syracuse, N. Y.

GLASS, NON-SHATTERABLE

American Window Glass Co., Pittsburgh, Pa.
Libbey-Owens-Ford Glass Co., Toledo, Ohio
*Pittsburgh Plate Glass Co., Pittsburgh, Pa.

GOVERNORS, ENGINE

*Consolidated Metals Co., Albany, N. Y.
Hoof Products Co., 6543 S. Laramie Ave., Chicago 38, Ill.
King Seeley Corp., Ann Arbor, Mich.
Klemm Automotive Prods. Co., 1718 N. Damen Ave., Chicago 47, Ill.
Monarch Governor Co., Detroit, Mich.
Pierce Governor Co., Anderson, Ind.
Protex Glass Co., 220 Fifth Ave., New York, N. Y.
Rohm & Haas Co., Philadelphia 5, Pa.
Safetee Glass Co., Philadelphia, Pa.
Woodward Governor Co., Rockford, Ill.
*Zenith Carburetor Div., Bendix Aviation Corp., Detroit, Mich.

GRILLS, METAL

*Evans Products Co., Detroit 27, Mich.
Gross Engineering Co., Carbondale, Pa.

HARDWARE and FITTINGS, BODY

Ackerman-Blaesser-Fezzey, Detroit, Mich.
*Attwood Brass Works, Grand Rapids 4, Mich.
Auto Vehicle Parts Co., Newport, Ky.
Bassick Mfg. Co., Bridgeport, Conn.
Cleveland, Hardware & Forging Co., Cleveland, Ohio
Cowles & Co., C., New Haven, Conn.
Duro Metal Products Co., 2649 N. Kildare Ave., Chicago, Ill.
Eberhard Mfg. Co., Cleveland 4, Ohio
*Edwards Co., O. M., Syracuse, N. Y.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Elicon Co., 50 Church St., New York, N. Y.
Excel Corp., Elkhart, Ind.
Hansen Mfg. Co., A. L., 5037 Ravenswood Ave., Chicago, Ill.
Heli-Coil Co., Danbury, Conn.
Herron-Zimmers Moulding Co., Detroit 12, Mich.
*Moore & Co., Sam., Mantua, Ohio
National Lock Washer Co., Newark, N. J.
Tompkins, H. S., 82 Dey St., New York, N. Y.
Troy Sunshade Co., Troy, Ohio
Tubecraft, Inc., Cleveland 2, Ohio
Wellman Bronze & Aluminum Co., Cleveland 4, Ohio
Woodruff & Sons Co., Walter W., Mt. Carmel, Conn.

HEATERS, BUS BODY

Cadillac Co., Inc., Coldwater, Mich.
*Consolidated Metals Co., Albany, N. Y.
Chicago Mfg. Co., 411 N. Trumble St., Chicago, Ill.
E. A. Laboratories, Brooklyn, N. Y.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
*Evans Products Co., Plymouth, Mich.
General Elec. Co., Schenectady 5, N. Y.
*Hans Industries, Edmund, Detroit 4, Mich.
Hunter & Co., Cleveland 14, Ohio
Kysor Heater Co., Cadillac, Mich.
Liberty Foundries Co., Rockford, Ill.
Lintern, Inc., A. R., Detroit 27, Mich.
*Luminator, Inc., 120 N. Peoria St., Chicago, Ill.
McCord Corp., Detroit, Mich.
Murray Mfg. Co., D. J., Wausau, Wis.
Stewart-Warner Corp., South Wind Heater Div., Indianapolis, Ind.
Toledo Heater Co., Toledo 1, Ohio
*Vapor Heating Corp. Railway Exchange Bldg., Chicago, Ill.

HEATERS, ENGINE

Anchor Post Products, Inc., Baltimore 24, Md.
Bridgeport Thermostat Co., Bridgeport, Conn.
*Consolidated Metals Co., Albany, N. Y.
Hunter & Co., Cleveland, Ohio
Perfection Stove Co., Cleveland, Ohio
Ross Heater & Mfg. Co., Inc., Buffalo 13, N. Y.
*Surface Combustion Corp., Columbus 16, Ohio

HORNS—See Signals, Warning

HOSE, AIR, TIRE INFLATING, RADIATOR and WATER

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Rubber Works, Erie, Pa.
Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
*Gates Rubber Co., Denver 17, Colo.
*Goodrich Co., B. F., Akron 18, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
Manhattan Rubber Mfg. Div. Raybestos-Manhattan, Inc., Passaic, N. J.
*Moore & Co., Sam, Mantua, Ohio
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
*Thermoid Co., Trenton, N. J.
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.
*Weatherhead & Co., Cleveland 8, Ohio

HOSE, FLEXIBLE METALLIC—See Tubing, Flexible Metallic

INJECTORS, FUEL & LUBE—See Pumps and Injectors

INSULATION, BODY

Alfoil Insulation Co., 155 E. 44th St., New York 17, N. Y.
American Felt Co., Glenville, Conn.
American Hair & Felt Co., Merchandise Mart, Chicago 5A, Ill.
Armstrong Cork Co., Lancaster, Pa.
Burgess Battery Co., 500 W. Huron St. Chicago, Ill.
Celotex Corp., 919 N. Michigan Ave., Chicago 3, Ill.
Dow Chemical Co., Midland, Mich.
Dry-Zero Corp., Merchandise Mart, Chicago, Ill.
Felters Co., Boston, Mass.
Glass Fibres, Inc., Toledo, Ohio
Gustin-Bacon Mfg. Co., Kansas City, Mo
Insulite Div., Minnesota & Ontario Paper Co., Minneapolis 2, Minn.
Libbey-Owens-Ford Co., Toledo, Ohio
Masonite Corp., 111 W. Washington St., Chicago, Ill.
Owens-Corning Fiberglass Corp., Toledo, Ohio
Seaman Paper Co., 220 W. Adams St. Chicago, Ill.

INSURANCE

American Mutual Ins. Co., Boston, Mass.
Joyce & Co., Inc., 105 W. Adams St., Chicago, Ill.
Liberty Mutual Ins. Co., Boston, Mass.
Markel Service, Inc., Richmond, Va.

JOINTS, UNIVERSAL

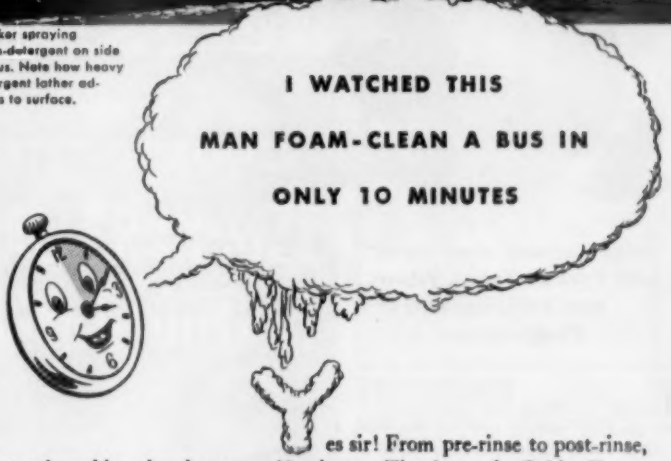
*Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
Blood Bros. Machine Div., Standard Steel Spring Co., Allegan, Mich.
Mechanics Universal Joint Div., Borg Warner Corp., Rockford, Ill.
Morse Chain Co. Ithaca, N. Y.
New England Auto Products Corp., Pottstown, Pa.
New Process Gear, Inc., Syracuse, N. Y
*Spicer Mfg. Div. of Dana Corp., Toledo 1, Ohio
Universal Products Co., Dearborn, Mich.

KITS, FIRST AID

Bauer & Black Div., Kendall Co., 2500 S Dearborn St., Chicago, Ill.
Bullard Co., E. D., San Francisco, Calif
Burroughs Welcome & Co., 9 E. 41st St., New York 17, N. Y.
Johnson & Johnson, New Brunswick, N. J
Mine Safety Appliances Co., Pittsburgh Pa.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year

Worker spraying foam-detergent on side of bus. Note how heavy detergent lather adheres to surface.



es sir! From pre-rinse to post-rinse, total washing time is a mere 10 minutes. Thanks to the Oakite Foam-Spray Unit, this man shaves hours a day off fleet maintenance time.

The Oakite Foam-Spray Unit blankets the exterior surface of any vehicle with a detergent foam. The foam sticks to the surface like lather . . . goes to work quickly, loosening road soils. A light brushing follows and you're ready to rinse. The Oakite Foam-Spray Unit is simple to set up, easy to use. It means multiple savings because you use less detergent, eliminate waste from spillage, and get the work done in only a fraction of the time old fashioned brush and bucket methods take.

Investigate this new cleaning method today. You can get the full story by writing for handsomely illustrated folder F-9254. Learn the secret of inexpensive Foam-Cleaning by getting your copy now. It's FREE on request. Write: Oakite Products, Inc., 16C Rector Street, New York 6, N. Y.

Unit illustrated. Use either Oakite Composition No. 70 or No. 72, both specially developed to give outstanding results on vehicle body washing.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

MOBILFONE

BUS PUBLIC ADDRESS SYSTEM

- LOW in price
- LOW installation cost
- LOW in maintenance

Unique circuit does away with Vacuum Tubes, Vibrators and Fragile Components

The Chicago Gray Line Inc. says, "For the past 12 months and for the first time in the past seven years, we have 12 months of perfect operation without trouble of any type. These units are highly thought of by our maintenance men and drivers."

MOBILFONE is an outstanding improvement on present day electronic public address systems in vehicular applications due to its excellent voice reproduction plus such features as—battery drain reduced 50% or more—completely ruggedized—complete circuit protection—filter—control is hermetically sealed—no high voltages—provision for auxiliary microphone—no shielding required—no adjustments of any kind—no soldered connections required thereby reducing installation time 50% or more.

MOBILFONE effectively resists the destructive effects of severe vibration as well as high temperature and humidity.

Find out how MOBILFONE can be of definite value to you—learn why it is today's top performer—write for comprehensive sales bulletin. Free engineering consultation service.

ENTIRE SYSTEM COSTS APPROXIMATELY $135.00

MIDWEST AUDIO SERVICES
Box 345
PARK RIDGE · ILLINOIS

LABELS, IDENTIFICATION
Brady Co., W. H., Milwauke 3, Wis.

LACQUER—See Paint, Enamel and Lacquer

LAMPS, FOG and DITCH
American Bosch Corp., Springfield Mass.
Appleton Electric Co., 1701 W. Wellington Ave., Chicago, Ill.
*Arrow Safety Device Co., Mt. Holly, N. J.
Auto Lamp Mfg. Co., 2909 Indiana Ave., Chicago 16, Ill.
Betts Mfg. Co., Warren, Pa.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse 1, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Griffin Lamp Co., Hamilton, Ohio
Grote Mfg. Co., Bellevue, Ky.
K-D Lamp Co., Cincinnati, Ohio
Miro-Flex Co., Wichita, Kan.
S & M Lamp Co., Los Angeles 54, Calif.
Sparks Withington, Jackson, Mich.
Teleoptic Co., Racine, Wis.
Unity Mfg. Co., 2909 Indiana Ave., Chicago, Ill.
Yankee Metal Prods. Co., Norwalk, Conn.

LAMPS, HEAD, TAIL and MARKER
American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
*Arrow Safety Device Co., Mt. Holly, N. J.
Auto Lamp Mfg. Co., 2909 Indiana Ave., Chicago 16, Ill.
Betts Mfg. Co., Warren, Pa.
*Dietz Co., R. E., 225 Wilkinson St., Syracuse, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia, 32, Pa.
Griffin Lamp Co., Hamilton, Ohio
Grote Mfg. Co., Bellevue, Ky.
*Guide Lamp Div., General Motors Corp., Anderson, Ind.
Hall Lamp Co., C. M., Detroit 7, Mich.
K-D Lamp Co., Cincinnati, Ohio
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Signal Stat Corp., Brooklyn, N. Y.
S & M Lamp Co., Los Angeles 54, Calif.
Sparks-Withington Co., Jackson, Mich.
Trippe Mfg. Co., 609 W. Lake St., Chicago, Ill.
Yankee Metal Prods. Co., Norwalk, Conn.

LAMPS, INTERIOR—See Fixtures and Fittings, Lamp

LAMPS, MINIATURE INCANDESCENT
General Electric Co., Lamp Dept., Cleveland 12, Ohio
Herzog Miniature Lamp Works, Long Island City, N. Y.
National Carbon Co., 30 E. 42nd St., New York 17, N. Y.
North American Electric Lamp Co., St. Louis 6, Mo.
Sylvania Electric Products Co., 500 Fifth Ave., New York 18, N. Y.
Trippe Mfg. Co., 609 W. Lake St., Chicago, Ill.
*Tung-Sol Electric Corp., Newark 4, N. J.
Westinghouse Electric Corp., Bloomfield, N. J.

LEATHER, ARTIFICIAL
Chicopee Mfg. Co., 47 Worth St., New York, N. Y.
*du Pont de Nemours & Co., E. I., Wilmington, Delaware
Firestone Industrial Products Co., Akron, Ohio
*Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y.
*Goodrich Co., B. F., Akron 18, Ohio
Hooper & Sons Co., W. E., Philadelphia, Pa.
Masland Duraleather Co., Philadelphia, Pa.
Pantasote Co., 444 Madison Ave., New York, N. Y.
Reeves Bros. Co., 54 Worth St., New York, N. Y.
Susquehanna Mills, Inc., 404 Fourth Ave., New York, N. Y.
Textileather Corp., Toledo 4, Ohio
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

LEATHER, NATURAL
Astabula Hide & Leather Co., Astabula, Ohio
Blanchard Bros. & Lane, Newark, N. J.
Eagle-Ottawa Leather Co., Grand Haven, Mich.
General Leather Co., Newark, N. J.
Lackawanna Leather Co., Hackettstown, N. J.
Radel Leather Mfg. Co., Newark, N. J.

LININGS and BLOCKS, BRAKE
*American Brake Shoe Co., American Brakeblok Div., Detroit, Mich.
Anchor Packing Co., Philadelphia, Pa.
Asbestos Mfg. Co., Huntington, Ind.
Atlas Asbestos Co., North Wales, Pa.
*Bendix Marshall-Eclipse, Troy, N. Y.
Fibre & Metal Products, Inc., Downey, Calif.
*Firestone Tire & Rubber Co., Akron, Ohio
Gatke Corp., 228 N. LaSalle St., Chicago, Ill.
General Metals Powder Co., Akron, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
*Grey-Rock Div., Raybestos-Manhattan, Inc., Manheim, Pa.
Grizzly Mfg. Co., Paulding, Ohio
*Inland Mfg. Div., General Motors Corp., Dayton, Ohio
*Johns-Manville, 22 E. 40th St., New York 16, N. Y.
*Lasco Brake Product Corp., Ltd., 2619 Magnolia St., Oakland, Calif.
Manhattan Rubber Mfg. Div., Raybestos-Manhattan, Inc., Passaic, N. J.
Miley Co., L. J., 1060 W. Adams St., Chicago, Ill.
Molded Materials, Inc., Philadelphia, Pa.
*Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.
Reddaway Brake Lining Co., Newark, N. J.
Russell Mfg. Co., Middletown, Conn.
Scandinavia Belting Co., Newark, N. J.
Southern Friction Materials Co., Charlotte, N. C.
*Thermoid Co., Trenton, N. J.
*Wagner Electric Corp., St. Louis 14, Mo.
Wellman Co., S. K., Cleveland, Ohio
World Bestos Corp., New Castle, Ind.

LUBRICATORS—See Pumps and Injectors

MACHINES, VENDING
*Transportation Vendors, Inc., 60 Park Pl., Newark 2, N. J.

MANAGEMENT, CONSULTING, FINANCIAL SERVICES
The Omnibus Corp., 134 N. La Salle, Chicago 2, Ill.

MIRRORS, REAR VISION
Acme Specialty Mfg. Co., Toledo, Ohio
American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
Anzell Specialty Mfg. Co., Brooklyn, N. Y.
Arrow Safety Device Co., Mt. Holly, N. J.
Dietz Co., R. E., 225 Wilkinson St., Syracuse 1, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago 5, Ill.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
K-D Lamp Co., Cincinnati, Ohio
Miro-Flex Co., Wichita, Kan.
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Sparks-Withington Co., Jackson, Mich.
Trico Products Corp., Buffalo, N. Y.
Speaker & Co., J. W., Milwaukee, Wis.
Yankee Metal Prods. Co., Norwalk, Conn.
Whitehead Stamping Co., Detroit, Mich.

MUFFLERS, EXHAUST
A. P. Parts Co., Toledo, Ohio
Buffalo Pressed Steel Co., Youngstown 9, Ohio
Burgess Battery Co., Acoustic Div., 500 W. Huron St., Chicago, Ill.
Maremont Automotive Products, Inc., S. Ashland Ave., at 17th, Chicago, Ill.
Maxim Silencer Co., Hartford, Conn.
McCord Corp., Detroit, Mich.
Powell Muffler Co., Chicago, Ill.
Walker Mfg. Co., Racine, Wis.

OPERATORS, PNEUMATIC DOOR
*Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
Broten Controls, Inc., Rahway, N. J.
*Consolidated Metals Co., Albany, N. Y.
Electrol, Inc., Kingston, N. Y.
*Midland Steel Products Co., Detroit, Mich.
*National Pneumatic Co., 125 Amory St., Boston, Mass.

OVERHEAD, TROLLEY BUS
*Earll Co., C. I., York, Pa.
*Ohio Brass Co., Mansfield, Ohio
*Westinghouse Elec. Corp., Pittsburgh 30, Pa.

OXYGEN and GAS, COMPRESSED
Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.
Prest-O-Lite Co., 30 E. 42nd St., New York 17, N. Y.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

PAINT, ENAMEL and LACQUER

Acme White Lead & Color Works, Detroit, Mich.
American-Marietta Co., East Ohio St., Chicago 11, Ill.
Arco Co., Cleveland, Ohio
Ditzler Color Div., Pittsburgh Plate Glass Co., Detroit, Mich.
Dolphin Paint & Varnish Co., Toledo, Ohio
•du Pont de Nemours & Co., E. I., Wilmington, Del.
Egyptian Lacquer Mfg. Co., 1270 Sixth Ave., New York, N. Y.
Fuller & Co., W. P., San Francisco 5, Calif.
Glidden Co., Cleveland 14, Ohio
Hercules Powder Co., 959 King St., Wilmington 99, Del.
Interchemical Corp., Newark 1, N. J.
Martin-Senour Co., 2520 Quarry, Chicago 8, Ill.
McDougall-Butler Co., Buffalo, N. Y.
Midland Paint & Varnish Co., Cleveland 5, Ohio
Monsanto Chem. Co., Merrimac Div., Boston, Mass.
Nason & Co., R. N., San Francisco 3, Calif.
Pabco Products Inc., San Francisco, Calif.
Patterson Sargent Co., Cleveland, Ohio
•Pittsburgh Plate Glass Co., Pittsburgh 22, Pa.
Pratt & Lambert, Inc., Buffalo, N. Y.
Rinshed-Mason Co., Detroit 10, Mich.
Sherwin-Williams Co., Cleveland 1, Ohio
Sonneborn Sons, L., 88 Lexington Ave., New York, N. Y.
Valentine & Co., 11 E. 36th St., New York 16, N. Y.
Walker Co., H. V., Elizabeth, N. J.
Zapon Div. Atlas Powder Co., Stamford, Conn.

PANELS and FABRICATIONS, BODY

Alan Wood Steel Co., Conshohocken, Pa.
Algoma Plywood & Veneer Co., Algoma, Wis.
•Aluminum Co. of America, Pittsburgh 19 Pa.
American Hair & Felt Co., Merchandise Mart, Chicago, Ill.
American Rolling Mills Co., Middletown, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Buhelen Lumber & Mfg. Co., Tacoma, Wash.
Formica Insulation Co., Cincinnati 32, Ohio
Great Lakes Steel Co., Ecorse, Mich.
Harbor Plywood Corp., Hoquiam, Wash.
Haskelite Mfg. Corp., Grand Rapids 2, Mich.
International Nickel Co., 67 Wall St., New York 5, N. Y.
Kaiser Aluminum & Chemical Sales Corp., Oakland, Calif.
Masonite Co., 111 W. Washington St., Chicago, Ill.
Nicralumin Co., Wilmington, Del.
Noblitt-Sparks Industries, Columbus, Ind.
Republic Steel Corp., Cleveland 1, Ohio
•Reynolds Metals Co., Louisville, Ky.
•Rigidized Metals Corp., 6726 Ohio St., Buffalo, N. Y.
St. Regis Paper Co., 230 Park Ave., New York 17, N. Y.
Snedaker & Co., F. C., Philadelphia 40, Pa.
Superior Sheet Steel Co., Canton, Ohio
U. S. Plywood Corp., 616 W. 46th St., New York 19, N. Y.
U. S. Steel Corp., Pittsburgh, Pa.
Washington Veneer Co., Olympia, Wash.
Youngstown Sheet & Tube Co., Youngstown, Ohio

PANELS, FUSE and JUNCTION BLOCKS

Rohden Mfg. Co., 4739 Montrose Ave., Chicago 41, Ill.

PISTONS and PINS

•Aluminum Co. of America, Pittsburgh 19, Pa.
Aluminum Industries, Inc., Cincinnati 25, Ohio
Arrow Head Steel Products Co., Howell, Mich.
Burgess-Norton Mfg. Co., Geneva, Ill.
Deluxe Products Corp., La Porte, Ind.
D.S.C. Industries, Inc., Medina, Ohio
Elgin Machine Works, Elgin, Ill.
Gillett & Eaton, Inc., Lake City, Minn.
King Quality Products Co., St. Louis, Mo
McQuay-Norris Mfg. Co., St. Louis, Mo.
Ohio Piston Corp., Cleveland, Ohio
•Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
•Toledo Steel Products Co., Toledo 1, Ohio
United Engine & Mach. Co., San Leandro, Calif.
Wisconsin Machinery & Mfg. Co., West Allis, Wis.
•Zollner Mach. Works, Fort Wayne, Ind.

PLATES, STEP (Non-Skid)

Alan Wood Steel Co., Conshohocken, Pa.
American Abrasive Metals Co., Irvington., N. J.
•Attwood Brass Works, Grand Rapids 4, Mich.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
•Meiflex Products Co., Akron 3, Ohio
•Moore & Co., Sam, Mantua, Ohio
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
Morton Mfg. Co., 5105 W. Lake St., Chicago 44, Ill.
Turner Brass Works, Sycamore, Ill.

PLOWS, SNOW

Flink Co., Streator, Ill.
Good Roads Machinery Corp., Kennett Square, Pa.
Walter Truck Co., Brooklyn, N. Y.

POLISH, BODY and METAL

Commercial Chem. Co., Charlestown, Mass.
•du Pont de Nemours & Co., E. I., Wilmington, Del.
Franko Super Polish Products, Lyndhurst, N. J.
Hollingshead Corp., R. M., Camden, N. J.
Jewel Paint & Varnish Co., 345 N. Western Ave., Chicago, Ill.
Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Paul & Co., J. C., 930 Roscoe St., Chicago, Ill.
Park Chemical Co., Detroit, Mich.
Permatex Co., Brooklyn 35, N. Y.
Puritan Co., Rochester, N. Y.
Robertson Products Co., Theo. B., 700 W. Division, Chicago, Ill.
Sherwin-Williams Co., Cleveland 1, Ohio
Simoniz Co., 2100 S. Indiana Ave., Chicago 16, Ill.

NEW
HEATER-DEFROSTER
SMALLER IN SIZE
BIGGER IN OUTPUT

SMALL
only 8-1/16" x 8-5/16" x 8-3/8"

POWERFUL
17,800 BTU Output

EFFICIENT
split core and tank travel water further — heat lingers longer

HEAVY DUTY
"Continuous service" bus type motor — heavy duty truck service core

ADAPTABLE FOR RECIRCULATING OR FRESH AIR
Simple to connect to top or side cowl for fresh air intake

THE NEW
EVANS ED-75
provides more heat output than any other heater-defroster of its size

EVERY EVANS HEATER IS EQUIPPED WITH THE FAMOUS EVANS UNBREAKABLE LIGHTWEIGHT FAN. Precision die-molded airfoil section blades . . . move more air with less noise and current draw . . . will not chip, crack or bend . . . unaffected by temperature . . . one piece construction.

Evans Products Company, Dept. U-6, Plymouth, Mich.

EVANS ... BALANCED HEATING & VENTILATING SYSTEMS FOR EVERY TRUCK AND BUS

Sno-Flake Products Co., Detroit, Mich.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
Wilson Imperial Co., Newark, N. J.
Zinc Corp., Howard, Fremont, Ohio

PUMPS and INJECTORS, FUEL and LUBE

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
American Bosch Corp., Springfield, Mass.
*American Diesel Service, 7606 Lorain Ave., Cleveland 2, Ohio
Automotive & Marine Products Co., Boston, Mass.
Autopulse Corp., Ludington, Mich.
*Bendix, Eclipse Machine, Elmira, N. Y.
Carter Carburetor Corp., St. Louis, Mo.
Emerol Mfg. Co., 242 W. 69th St., New York, N. Y.
*Evans Products Co., Detroit 27, Mich.
Ex-Cell-O Corp., Detroit, Mich.
Stewart-Warner Corp., 1328 W. Diversey Parkway, Chicago 14, Ill.

PLYWOOD-MOLDED SHAPES

United States Molded Shapes, Inc., Grand Rapids, Mich.

RADIATORS, ENGINE COOLING

Excel Auto Radiator Co., 320 E. 21st Chicago, Ill:
Fedders Mfg. Co., Buffalo, N. Y.
Fleet Sales & Service Co., Mt. Vernon, N. Y.
Flexo Mfg. Co., Los Angeles, Calif.
G & O Mfg. Co., New Haven, Conn.
Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
Lasko Metal Products, West Chester, Pa.
Lake Auto Radiator Mfg. Co., The, Cleveland 3, Ohio
*Long Mfg. Div., Borg-Warner Corp., Detroit, Mich.
McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Perfex Corp., Milwaukee, Wis.
Young Radiator Co., Racine, Wis.

RADIO and ACCESSORIES, MOBILE

Bendix Aviation Corp., Towson, Md.
Communications Co., Coral Gables, Fla.
Farnsworth Television Radio Corp., Fort Wayne 1, Ind.
Federal Telephone & Radio Corp., Clifton, N. J.
General Electric Co., Syracuse, N. Y.
Hallett Mfg. Co., Inglewood, Calif.
Link Radio Corp., 125 W. 17th St., New York, N. Y.
*Mid-West Audio Service, Box 354, Park Ridge, Ill.
Motorola Inc., 4545 W. Augusta Blvd., Chicago, Ill.
Radio Corp. of America, Camden, N. J.
Sylvania Electric Products, Inc., Salem, Mass.
Transit Radio, Cincinnati 14, Ohio
*Westinghouse Elec. Corp., Pittsburgh, Pa.
Zenith Radio Corp., 6000 Dickens Ave., Chicago, Ill.

REGISTERS and DEVICES, FARE COLLECTING

Advance Products Co., Detroit, Mich.
Burroughs Adding Mach. Co., Detroit, Mich.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Galef & Son, J. L., 85 Chambers St., New York, N. Y.
General Register Co., Long Island City, N. Y.
*Grant Money-Meters Co., Providence, R. I.
International Register Co., 2620 Washington Blvd., Chicago, Ill.
*Johnson Fare Box Co., 4619 N. Ravenswood Ave., Chicago, Ill.
Knopf Inst. Co., Jersey City, N. J.
Lannon Products Corp., Nashville 3, Tenn.
Main Farebox Co., Willoughby, Ohio
Oliver Mach. Tool Co., 520 S. Michigan Ave., Chicago 11, Ill.
*Perey Turnstile Co., 101 Park Ave., New York 17, N. Y.
*Rockwell Register Corp., Belle Fonte, Ohio
*Veeder-Root, Inc., Hartford 2, Conn.

RINGS, PISTON

Aluminum Industries, Inc., Cincinnati 25, Ohio
American Hammered Piston Ring, Div. Muskegon, Mich.
Arrow Head Steel Prod. Co., Howell, Mich.
Burd Piston Ring Co., Rockford, Ill.
*Hastings Mfg. Co., Hastings, Mich.
King Quality Products Co., St. Louis, Mo.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Hoog-St. Louis Piston Ring Co., St. Louis, Mo.
*Perfect Circle Co., Hagerstown, Ind.
Ramsey Accessories Mfg. Corp., St. Louis, Mo.
*Sealed Power Corp., Muskegon, Mich.
Simplex Products Corp., Cleveland, Ohio
Thompson Mfg. Co., Peoria, Ill.
Thompson Products, Inc., Cleveland 3, Ohio
U. S. Hammered Piston Ring Co., Sterling, N. J.
Wausau Motor Parts Co., Wausau, Wis.
Wilkening Mfg. Co., Philadelphia, Pa.

RODS, CONNECTING

*Federal-Mogul Corp., Detroit 13, Mich.
Janibor Tool & Stamping Co., Milwaukee, Wis.
Morris, Inc., J. Leslie, Los Angeles 33, Calif.
Niagara Motors Corp., Dunkirk, N. Y.

RUBBER TO METAL BONDING

*Motor Devices Corp., 772 Tenth Ave., New York 17, N. Y.
*Metro Rubber Products Corp., Oak Lawn, Ill.

SANDERS, HIGHWAY

*Anderson Mach. & Tool Wks. Inc., Chaska, Minn.
Connecticut Telephone & Electric Corp., Meriden, Conn.
Elston Corp., St. Paul, Minn.
Flink Co., Streator, Ill.
Good Roads Machinery Corp., Kennett Square, Pa.
Highway Safety Appliance Co., St. Paul 4, Minn.
Lintern Corp., Ashtabula, Ohio
Power Sander Inc., Minneapolis, Minn.
Sterling Tool Products Co., 363 E. Ohio St., Chicago, Ill.
Tarrant Mfg. Co., Saratoga Springs, N. Y.
Walter Motor Truck Co., Brooklyn, N. Y.
Westlake Mfg. Corp., Canastota, N. Y.

SASH, WINDOW

*Adams & Westlake Co., Elkhart, Ind.
*Edwards Co O. M., Syracuse, N. Y.
Excel Corp., Elkhart, Ind.
General Seating Co., Topton, Pa.
Transportation Sash Co., Topton, Pa.
Visionator, Inc., Chicago 80, Ill.
Young Windows, Inc., Philadelphia 40, Pa.

SEALS and RINGS, OIL

Chicago Rawhide Mfg. Co., 1281 Elston Ave., Chicago, Ill.
Felt Products Mfg. Co., 1598 Carroll Ave., Chicago 7, Ill.
Fitzgerald Mfg. Co., Torrington, Conn.
National Motor Bearing Co., Redwood City, Calif.

SEATS

*American Seating Co., Grand Rapids, Mich.
Eckland Bros. Co., Minneapolis, Minn.
General Seating Co., Topton, Pa.
Hardman Mfg. Co., South Gate, Calif.
*Heywood-Wakefield Co., Gardner, Mass.
*Ionia Mfg. Co., Ionia, Mich.
McArthur Corp., Warren, 1 Park Ave., New York 16, N. Y.
*National Seating Co., 624 S. Michigan Ave., Chicago 15, Ill.
*Sam Moore & Co., Mantua, Ohio

SEAT BACKS—See Panels

SEATS, SPRING or RUBBER CUSHIONS for

Armour Curled Hair Work., Div. Armour & Co., 1255 W. 31st St., Chicago, Ill.
Atkinson Spring Co., F. R., Hamburg, N. Y.
Blocksom & Co., Michigan City, Ind.
Burkhart Mfg. Co., F., St. Louis, Mo.
Dunlop Tire & Rubber Corp., Buffalo, N. Y.
Firestone Industrial Products Co., Akron, Ohio
*Goodyear Tire & Rubber Co., Akron 16, Ohio
Hewitt Rubber Corp., Buffalo, N. Y.

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

REDUCE MAINTENANCE COSTS

Use Moto-Gard to reduce Maintenance Costs and insure Longer Life for Your Motors. Moto-Gard will protect your Motor against Damage from an Oil Failure or Overheating. It automatically stops the Motor Ahead of Any Damage if the Oil Pressure runs too low or the Motor gets too hot. MOTO-GARD will make your equipment Safer and More Profitable.

REASONABLY PRICED . . . EASILY INSTALLED

Full Information on Request

"Don't Buy Motors—Buy Moto-Gard"

THE MOTO-GARD COMPANY

Box 2425

Raleigh, North Carolina

McInerney Spring & Wire Co., Grand Rapids, Mich.
Nukraft Mfg. Co., Shelbyville, Ind.
Owen Silent Spring Co., Bridgeport, Conn.
Royersford Spring Co., Royersford, Pa.
Sponge Rubber Products Co., Derby, Conn.
*Tropic Aire, Inc., 4501 W. Augusta Blvd., Chicago, Ill.
*U. S. Rubber Co., Mishawaka, Ind.
Woll & Co., F. P., Philadelphia, Pa.

SEATS, VALVE (Replacement)

*Albertson & Co., Sioux City, Iowa
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Lee Co., K. O., Aberdeen, S. D.
Peterson Welding Laboratories, Kansas City 6, Mo.
Thompson Products, Inc., Cleveland 3, Ohio

SHAFTS, AXLE and PROPELLER

Automotive Gear Works, Richmond, Ind.
Brandt-Warner Mfg. Co., York, Pa.
Champ-Items, Inc., St. Louis, Mo.
Eaton Mfg. Co., Cleveland, Ohio
Foote Axle & Forge Co., Los Angeles 33, Calif.
Foreman Mfg. Co., 5353 S. State St., Chicago 9, Ill.
Lempco Products, Inc., Bedford, Ohio
Micro Test Gear Co., Indianapolis, Ind.
Morse Chain Co., Ithaca, N. Y.
Standard Forge & Axle Co., Montgomery, Ala.
*Timken-Detroit Axle Co., Detroit, Mich.
U. S. Axle Co., Pottstown, Pa.

SHIMS, LAMINATED

Laminated Shim Co., Glenbrook, Conn.
National Motor Bearing Co., Redwood City, Calif.

SHOCK-ABSORBERS

*Delco Products Div., General Motors Corp., Dayton, Ohio
*Gabriel Co., Cleveland, Ohio
Houde Engineering Div., Houdaille-Hershey Corp., Buffalo, N. Y.
Monroe Auto Eqpt. Co., Monroe, Mich.
*National Pneumatic Co., 125 Amory St., Boston, Mass.
*National Transport Supply, Inc., 545 E. Hancock, Detroit 1, Mich.

SHUTTERS, RADIATOR

Brewer-Titchener Corp., Cortland, N. Y.
Cadillac Co., Coldwater, Mich.
Kysor Heater Co., Cadillac, Mich.

SIGNALS, DIRECTIONAL and STOP

American Automatic Devices Co., 530 S. Throop St., Chicago, Ill.
American Bosch Corp., Springfield, Mass.
Arrow Safety Device Co., Mt. Holly, N. J.
Auto Lamp Mfg. Co., 2909 Indiana Ave., Chicago 16, Ill.
Betts Mfg. Co., Warren, Pa.
Carpenter Mfg. Co., E. W., Bridgeport 1, Conn.
Carolina Metal Products, Inc., Charlotte, N. C.
Dietz Co., R. E., 225 Wilkinson St., Syracuse, N. Y.
Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago, Ill.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Griffin Lamp Co., Hamilton, Ohio.
*Guide Lamp Div., General Motors Corp., Anderson, Ind.
K-D Lamp Co., Cincinnati, Ohio
Marion Truck Eqpt. Co., 2030 S. State St., Chicago 16, Ill.
Protectal Motor Signal Co., Syracuse, N. Y.
Safety Turn Signal, 4659 N. Clark St., Chicago, Ill.
Signal-Stat Corp., Brooklyn, N. Y.
Sparks-Withington Co., Jackson, Mich.
Taylor Eng. Co., E. C., Tuckahoe, N. Y.
Yankee Metal Products Corp., Norwalk, Conn.

SIGNALS, FILL

*Scully Signal Co., Cambridge 41, Mass.

SIGNALS, PASSENGER STOP

*Consolidated Metals Co., Albany, N. Y.
*Delco-Remy Div. General Motors Corp., Anderson, Ind.
*Electric Service Mfg. Co., Philadelphia 32, Pa.

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Pick EARLL and you can't go wrong!

EARLL

TROLLEY RETRIEVERS

Transit men have learned from years of use that EARLL Trolley Retrievers and Catchers are needed for better service!

Both the Retriever and Catcher are made with precision accuracy which, combined with built-in ruggedness and strength, make them *efficient* and *economical in operation.*

They function quietly, require a minimum of care and attention, and are long-lasting. For further details, write us today.

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INTERNATIONAL GENERAL ELECTRIC CO.
570 LEXINGTON AVE.,
NEW YORK 22, N. Y.

CANADIAN DISTRIBUTORS
RAILWAY & POWER ENGINEERING CORPORATION, LTD.
TORONTO, ONT.

C. I. EARLL COMPANY, Inc.
YORK, PA.

Bendix automotive Electric Fuel Pump

Result
- Better gas mileage
- Less frequent overhauls
- Better schedules

As every truck operator knows, vapor lock seriously affects operating efficiency. Not only is gas mileage reduced, but power and speed are cut to the point where maintaining "on time" schedules becomes a problem. Worst of all, when vapor lock occurs frequently, exhaust valves burn out and expensive overhauls are necessary.

Now you can banish all these troubles and positively prevent vapor lock by installing the performance-proven Bendix* Electric Fuel Pump.

Sold by independent garages and service stations. Descriptive folder available on request. Write to Dept. A.

*REG. U.S. PAT. OFF.

ECLIPSE MACHINE DIVISION

Elmira, New York · Division of Bendix AVIATION CORPORATION

Check these Features

- Prevents vapor lock.
- Built-in pressure release—no flooding.
- Instant hot weather re-starts.
- 30 gallons per hour.
- Helium sealed—for longest life.
- Better cold weather starting.
- Only 7 watts power at maximum fuel delivery.

Faraday Electric Corp., Adrian, Mich.
Graybar Electric Co., 420 Lexington Ave., New York 17, N. Y. (Jobbers)
Jessall Plastic, Inc., Hartford, Conn.

SIGNALS, WARNING (Horns, Air and Electric Types)

American Bosch Corp., Springfield, Mass.
*Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio
*Delco-Remy Div., General Motors Corp., Anderson, Ind.
*Electric Auto-Lite Co., Toledo, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Grover Products Co., Los Angeles 15, Calif.
Monroe Standard, Inc., Galion, Ohio
Sparks-Withington Co., Jackson, Mich.

SIGNS, DESTINATION

*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hunter Illuminated Car Sign Co., Flushing, N. Y.
Railway Utility Co., 2241 S. Indiana Ave., Chicago, Ill.

SOAP & DETERGENTS

Colgate-Palmolive-Peet Co., Jersey City, N. J.
Cudahy Packing Co., 221 N. La Salle St., Chicago, Ill.
Drew & Co., E. F., 15 E. 26th St., New York, N. Y.
Fine Organics, Inc., 211 E. 19th St., New York, N. Y.
Hollingshead Corp., R. M., Camden, N. J.
Kelite Products, Inc., Los Angeles 1, Calif.
Miller Mfg. Co., Camden, N. J.
*Oronite Chemical Co., 38 Sansome St., San Francisco 4, Calif.
Procter & Gamble Co., Cincinnati, Ohio
Puritan Co., Rochester, N. Y.
Robertson Products Co., Thos. B., 700 W. Division St., Chicago, Ill.
Safety & Maintenance Co., 1 Wall St., New York, N. Y.
Stanley Co., John T., 624 West 30th St., New York 16, N. Y.
Turco Products, Inc., Los Angeles 1, Calif.

SOLDER

Allen & Co., L. B., 6727 W. Bryn Mawr Ave., Chicago, Ill.
American Smelting & Ref. Co., 120 Broadway, New York, N. Y.
Crown Aluminum Solder Co., 852 E. 134th St., New York, N. Y.
Gardiner Metal Co., 4343 S. Campbell Ave., Chicago 32, Ill.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Lenk Mfg. Co., Newton Lower Falls, Mass.
Rocket Distributors, Inc., Bayside, L. I., N. Y.

SOLUTIONS, PARTS CLEANING

Curran Corp., Malden, Mass.
Detrex Corp., Detroit, Mich.
Fine Organics, Inc., 211 E. 19th St., New York, N. Y.
Ford Co., J. B., Wyandotte, Mich.
Fre-ese Products Co., Atlanta 3, Ga.
Gerlach Co., E. A., Philadelphia 40, Pa.
Kelite Products, Inc., Los Angeles 1, Calif.
Lavo Co. of America, Milwaukee, Wis.
MacDermid, Inc., Waterbury, Conn.
*Magnus Chemical Co., Garwood, N. J.
Magnuson Prod. Corp., Brooklyn, N. Y.
*Oakite Products, Inc., 22 Thames St., New York 6, N. Y.
Pennsylvania Refining Co., Cleveland 4, Ohio
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Rust Master Chem. Co., Boston, Mass.
Safety & Maintenance Co., 1 Wall St., New York, N. Y.
Solventol Chem. Products, Inc., Detroit, Mich.
Stanley Co., J. T., 642 W. 30th St., New York 16, N. Y.
Turco Products, Inc., Los Angeles 1, Calif.
Wyandotte Chemicals Corp., Wyandotte, Mich.

SPARK PLUGS

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
American Bosch Corp., Springfield, Mass.
Auburn Spark Plug Co., Auburn, N. Y.
*Bowers Battery & Spark Plug Co., Reading, Pa.
B. G. Corp., 136 W. 52nd St., New York, N. Y.
Blue Crown Spark Plug Co., 1800 W. Winnemac, Chicago, Ill.
*Champion Spark Plug Co., Toledo, Ohio
*Electric Auto-Lite Co., Toledo, Ohio

*Firestone Tire & Rubber Co., Akron, Ohio
Globe-Union, Inc., Milwaukee, Wis.
Hastings Mfg. Co., Hastings, Mich.

SPEEDOMETERS, ODOMETERS, TACHOMETERS

*A. C. Spark Plug Div., General Motors Corp., Flint, Mich.
Bendix Pioneer Instrument Co., Bendix, N. J.
Corbin Screw Corp., New Britain, Conn.
Cramer & Co., R. W., Centerbrook, Conn.
*Electric Auto-Lite Co., Toledo, Ohio
*Engler Instrument Co., 255 Culver Ave., Jersey City, N. J.
General Electric Co., Schenectady 5, N. Y.
Jones-Motrola, Stamford, Conn.
Knopf Instrument Co., Jersey City, N. J.
Stewart-Warner Corp., 1828 W. Diversey Pkwy., Chicago 14, Ill.
*Veeder-Root, Inc., Hartford 2, Conn.
*Wagner Electric Corp., St. Louis 14, Mo.
Weston Electrical Instrument Co., Newark 5, N. J.

SPRINGS, BUS

Atkinson Spring Co., F. R., Hamburg, N. Y.
Eaton Mfg. Co., Cleveland, Ohio
Harvey Spring & Forging Co., Racine, Wis.
Iron City Spring Co., Pittsburgh, Pa.
*Laher Spring & Tire Corp., 2619 Magnolia St., Oakland, Calif.
Maremont Automotive Products, Inc., S. Ashland St., at 17th, Chicago, Ill.
Mather Spring Co., Toledo, Ohio
Merrill Spring Co., 530 W. 28th St., New York 1, N. Y.
Rowland, Inc., W. & H., Philadelphia, Pa.
St. Louis Spring Co., St. Louis, Mo.
Service Spring Co., Indianapolis, Ind.
Standard Steel Spring Co., Corapolis, Pa.
Trainor National Spring Co., New Castle, Ind.
Tuthill Spring Co., 760 W. Polk St., Chicago, Ill.
U. S. Spring & Bumper Co., Los Angeles 11, Calif.

STAMPINGS—See Panels

STENCILS

Dicks Co., C. O., Detroit, Mich.

SUPPLEMENTS, FUEL

*Bell Laboratory, Inc., Orlando, Fla.

TANKS, AUXILIARY OIL

Walden, Inc., S. L., Philadelphia, Pa.

TAPE, MASKING

*De Vilbiss Co., Toledo, Ohio
Eastman Kodak Co., Rochester, N. Y.
*Permacel Tape Corp., New Brunswick, N. J.
Minnesota Mining & Mfg. Co., St. Paul 6, Minn.
Seamless Rubber Co., New Haven, Conn
Technical Tape Corp., New York 53, N. Y.
Toplight Tape Co., York, Pa.
Van Cleef Bros., Inc., 7800 S. Woodlawn Ave., Chicago 19, Ill.

TERMINALS, BATTERY

*David & Co., Inc., 881 Market, Paterson 3, N. J.

THERMOSTATS and CONTROLS

Bishop & Babcock Mfg. Co., Cleveland 14, Ohio
Bridgeport Thermostat Co., Bridgeport, Conn.
Dole Valve Co., 1901 Carroll Ave., Chicago, Ill.
*Evans Products Co., Detroit 27, Mich.
Fulton Syphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
*Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.
*Moto-Gard Co., Raleigh, N. C.
Mu Switch Corp., Canton, Mass.
Spencer Thermostat Co., Attleboro, Mass.
*Vapor Heating Corp., 80 E. Jackson Blvd., Chicago 4, Ill.

TICKETS and TOKENS

General Ticket Co., Nashville, Tenn.
*Meyer & Wenthe, Inc., 30 South Jefferson St., Chicago 6, Ill.
Rand McNally & Co., 536 S. Clark St., Chicago, Ill.
Waterbury Cos., Inc., Waterbury, Conn.

TIRES and TUBES

Armstrong Rubber Co., West Haven, Conn.
Cooper Tire & Rubber Corp., Finlay, Ohio
Dayton Rubber Mfg. Co., Dayton, Ohio
*Firestone Tire & Rubber Co., Akron, Ohio
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio
*Goodyear Tire & Rubber Co., Akron, Ohio
*Goodrich Co., B. F., Akron, Ohio
Kelly-Springfield Tire Co., Cumberland, Md.
*Laher Tire & Rubber Co., 2619 Magnolia St., Oakland, Calif.
Lee Tire & Rubber Co., Conshohocken, Pa.
Mansfield Tire & Rubber Co., Mansfield, Ohio
McCreary Tire Co., Indiana, Pa.
Mohawk Rubber Co., Akron, Ohio
Pennsylvania Rubber Co., Mansfield, Ohio
Polson Rubber Co., Garrettsville, Ohio
Seiberling Rubber Co., Barberton, Ohio
*U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

TRANSMISSIONS—See Gears, Transmission

TRANSMISSION SERVICE—AUTOMATIC

*Trans-Main Corp, Kent, Ohio

TUBING, FLEXIBLE METALLIC

*Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., Waterbury, Conn.
Bendix-Eclipse, Teterboro, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Metal Hose Corp., 1315 S. Third Ave., Maywood, Ill.
Flex-O-Tube Co., Detroit 16, Mich.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia 42, Pa.
Resistoflex Corp., Belleville, N. J.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Titeflex, Inc., Newark, N. Y.
*Weatherhead Co., Cleveland 8, Ohio

TUBING, OIL and GASOLINE LINE and HYDRAULIC

*Aeroquip Corp., Jackson, Mich.
American Brass Co., Waterbury, Conn.
American Tube Bending Co., New Haven, Conn.
Bendix-Eclipse, Teterboro, N. J.
Chase Brass & Copper Co., Waterburg 91, Conn.
*DeVilbiss Spray Sys., Toledo, Ohio
Ilsco Copper Tube & Products Co., Cincinnati 27, Ohio
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Parker Appliance Co., Cleveland, Ohio
Penn. Brass & Copper Co., Erie, Pa.
Resistoflex Corp., Belleville, N. J.

UNIFORMS, CAPS and BADGES

Abrahams & Co., Inc., S. Cadillac Bldg. Broad St. at Ridge Ave., Philadelphia 23, Pa.
Ben's Uniforms, 15492 Livernois Ave. Detroit 21, Mich.
Dubois & Son, A. 17 Union Square, New York, N. Y.
Fechheimer Bros. & Co., 4th & Pike Sts., Cincinnati, Ohio.
Frankel & Son, Louis J., 407 El Pico Blvd., Los Angeles 15, Calif.
Gelhaar Uniform Co., 1230 Grand Ave Kansas City 6, Mo.
Goldstein, Inc., Jeff, 387 Fourth Ave. New York, N. Y.
Hirsch Tyler Co., 10th & Berks Sts., Philadelphia, Pa.
Howard Uniform Co., 313 W. Baltimore St., Baltimore, Md.
Lavigne, Inc., Donald S., 29 S. E. First Ave., Miami 32, Fla.
Loev Brothers, 3014 Kensington Ave., Philadelphia 24, Pa.
M & J Tailoring Co., 301 West 10th St., Kansas City, Mo.
Magson Uniform Co., 270 New Britain, Rd., Kensington, Conn.
*Maier-Lavaty Co., Inc., 315 S. Peoria St., Chicago, Ill.
Meier & Co., A. G., 205 W. Monroe St., Chicago, Ill.
*Metcalf Bros. & Co., Inc., 45 E. 17th St., New York, N. Y.
Penn Garment Co., 330 State St., Williamsport, Pa.
Peetibone Bros. Mfg. Co., 628 Sycamore St., Cincinnati 2, Ohio
Reed's Sons, Jacob, 1424 Chestnut St., Philadelphia, Pa.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Titeflex, Inc., Newark, N. J.
*Weatherhead Co., Cleveland 8, Ohio

Stock This "Quadruple-Threat" Cleaner for Chasing Oily, Greasy Dirt!

Use Magnusol concentrate in any of these low-cost, time-saving and safe cleaning jobs . . .

For Engines, Chassis and Underbodies

Spray surfaces to be cleaned with Magnusol solution. Let soak. Then rinse with water for a really clean, labor-saving job.

For Very Greasy Floors

Spray or brush on solution. Let soak a few minutes. Then rinse.

For Extra Dirty Bodies

Spray or brush on the solution. Let soak a few minutes, then rinse with water. Dirt is gone . . . body finish is as good as new.

For Miscellaneous Parts

Place parts in tank containing the Magnusol mix. Take them out as needed . . . rinse with water, and you have clean, oil-free, greaseless pieces.

Magnusol is safe for all metals . . . is non-toxic and non-flammable.

Get Acquainted with This "Quadruple-Threat" Cleaner

Write for details on the Magnus 30-day trial offer.

magnus

MAGNUS CHEMICAL CO., INC.
39 South Ave., Garwood, N. J.
In Canada: Magnus Chemicals, Ltd., Montreal
Service Representatives in Principal Cities

MARVEL

THE MODERN Scrub-Sweep METHOD

Marvel model 234

Saves Time and Money—Here's Why!

New Oscillating Wonder Brush provides safe, sure, once-over brush action. No Dust—New Vacu-Catchall cuts dust to absolute minimum. Power to Spare—10 H.P. 4-cylinder engine in the 44; 7½ H.P. 1 cylinder in the 34.

Quality—all heavy-duty materials, made for years of wear

Easy accessibility to all moving parts for service

Ample-Capacity, easily-removed dust and refuse container

Unobstructed vision for safety and close to wall sweeping

Licks the man-power problem—one man does the work of many

Cuts fatigue—comfortable seat on the 44—wide standee plate on the 34

Proven use—satisfied customers from coast to coast

Complete information on request

Marvel model 244

RAPID SALES CORPORATION

3521 Lake St.

Melrose Park, Ill.

Reeves Bros., Inc., 54 Worth St., New York, N. Y.
Weiman & Sons, H. I., 1427-33 Vine St., Philadelphia, Pa.
Weintraub Bros. & Co. 1321 Noble St., Philadelphia 23 Pa.

UNIVERSALS—See Joints, Universal

UPHOLSTERY—See Fabrics—also Leather

VALVES, ENGINE

Automotive Products Corp., Cincinnati 25, Ohio
Eaton Mfg. Co., Cleveland, Ohio
King Quality Products Co., St. Louis, Mo.
McQuay-Norris Mfg. Co., St. Louis, Mo.
*Sealed Power Corp., Muskegon, Mich.
Thompson Products, Inc., Cleveland 3, Ohio
*Toledo Steel Products Co., Toledo 1, Ohio
Wilcox-Rich Div., Eaton Mfg. Co., Detroit, Mich.

VALVES, TIRE

Dill Mfg. Co., Cleveland 8, Ohio
Jenkins Bros., Inc., Bridgeport, Conn.
Lacey Webber, Kalamazoo, Mich.
*Schraeder's Son, A., Div. Scovill Mfg. Co., Brooklyn, N. Y.

VENDING—See Machines, Vending

VENTILATORS

Anemostat Corp. of Amer., 10 E. 39th St., New York, N. Y.
Cadillac Co., Coldwater, Mich.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
*Evans Products Co., Detroit 27, Mich.
Garland Ventilator Co., 1511 E. Hyde Park, Chicago, Ill.
Kysor Heater Co., Cadillac, Mich.
Lintern, Inc., A. R., Detroit 27, Mich.
Railway Utility Co. 2241 S. Indiana Ave., Chicago, Ill.
Sturtevant Div., Westinghouse Electric Corp., Boston, Mass.

WASTE and WIPING RAGS

Advance Packing & Supply Co., 618 W. Adams St., Chicago, Ill.
Mill Remnants Co., 91 Mercer St., New York, N. Y.
Sanitary Institute of America, 100 W. Monroe St., Chicago, Ill.

WHEELS

*Aluminum Co. of Amer., Pittsburgh, Pa.
*Budd Co., The, Detroit, Mich.
*Clark Equipment Co., Buchanan, Mich.
Dayton Steel Foundry Co., Dayton, Ohio
*Gunlite Foundries Corp., Rockford, Ill.
Kelsey-Hayes Wheel Co., Detroit, Mich.
Motor Wheel Corp., Lansing, Mich.
Permold Co., Medina, Ohio

WINDOWS—See Sash, Window

WIPERS, WINDSHIELD

Air Associates, Inc., Bendix, N. J.
American Bosch Corp., Springfield, Mass.
Anderson Co., Gary, Ind.
*Electric Auto-Lite Co., Toledo, Ohio
Hays Corp., Michigan City, Ind.
Monroe-Acme Co., 215 N. Aberdeen St., Chicago, Ill.
*National Pneumatic Co., Graybar Bldg., New York 17, N. Y.
Sprague Devices, C. A., Michigan City, Ind.
Trico Products Corp., Buffalo, N. Y.

SHOP EQUIPMENT

ANALYZERS, EXHAUST GAS

Allen Elec. & Equip. Co., Kalamazoo, Mich.
Bennett-Feragen, South Bend, Ind.
*Breeze Corps, Newark, N. J.
Cambridge Instrument Co., Grand Central Terminal, New York, N. Y.
Engelhard, Inc., Chas., Newark, N. J.
Gow-Mac Instrument Co., Newark, N. J.
King Elec. Co., Cleveland, Ohio
Moto Meter Gauge & Equipment Div.,
*Electric Auto-Lite Co., Chrysler Bldg., New York 17, N. Y.
Precision Industries, Inc., Seattle, Wash.
Weidenhoff, Inc., Jos., Ft. Wayne, Ind.

BLOWERS, VENTILATING—See Fans and Blowers

BRUSHES, ROTARY WIRE

*Albertson & Co., Sioux City, Iowa
Osborn Mfg. Co., Cleveland, Ohio
Stow Mfg. Co., Binghamton, N. Y.
U. S. Electrical Tool Co., Cincinnati, Ohio
*Van Norman Co., Springfield, Mass.

BRUSHES, WASHING

Beaurline Fountain Brush Co., 1243 S. Wabash Ave., Chicago, Ill.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
*Flour City Brush Co., Minneapolis, Minn.
Fuller Brush Co., Hartford, Conn.
Kansas City Brush Co., Kansas City, Mo.
Laitner Brush Co., Detroit 26, Mich.
Milwaukee Dustless Brush Co., Milwaukee, Wis.
Osborn Mfg. Co., Cleveland, Ohio
*Pacific Coast Brush Co., Los Angeles 21, Calif.
Rapids Products Co., Cedar Rapids, Iowa
*Ross & White Co., 400 W. Madison, Chicago 6, Ill.
Thomas Fountain Brush Co., Nashville 6, Tenn.
Wilson Imperial Co., Newark, N. J.
Wolfe Brush Co., Pittsburgh, Pa.
Zimmerman Brush Works, Chicago 5, Ill.

CHARGERS, BATTERY

Allen Elec. & Equip. Co., Kalamazoo, Mich.
Baldor Electric Co., St. Louis 10, Mo.
Bean Mfg. Co., John, Lansing, Mich.
Benwood-Linze Co., St. Louis, Mo.
Electric Heat Control Co., Cleveland 5, Ohio
Electronic Laboratories, Inc., Indianapolis 4, Ind.
General Electric Co., Bridgeport, Conn.
Lanagan & Hoke, Philadelphia, Pa.
Lee Co., K. O., Aberdeen, S. D.
Marquette Mfg. Co., Minneapolis 14, Minn.
Mercury Corp., Kansas City, Mo.
Weidenhoff, Inc., Jos., Ft. Wayne, Ind.
*Willard Storage Battery Co., Cleveland 1, Ohio

CLEANERS, STEAM and AIR

Aeroil Prod. Co., South Hackensack, N. J.
Clayton Mfg. Co., Rosemead, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Kelite Products, Inc., Los Angeles, Calif.
Livingstone Engineering Co., Worcester, Mass.
*Magnus Chemical Co., Garwood, N. J.
*Oakite Products, Inc., 22 Thames, New York, N. Y.
*Storm-Vulcan, Inc., 2225 Burbank, Dallas, Texas
Turco Products, Inc., Los Angeles, Calif.
*Vapor Heating Corp., Railway Exchange Bldg., Chicago, Ill.

CLEANERS, VACUUM & POWER

Black & Decker Mfg. Co., Towson, Md.
Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 30, Ill.
Clements Mfg. Co., 6650 S. Narragansett, Chicago 38, Ill.
General Electric Co., Bridgeport, Conn.
Hardie Mfg. Co., Hudson, Mich.
Invincible Vacuum Cleaner Mfg. Co., Dover, Ohio
*Rapid Sales Corp., 3521 Lake St., Melrose Park, Ill.
Rexair, Inc., Detroit, Mich.
*Ross & White Co., 400 W. Madison, Chicago 6, Ill.
Spencer Turbine Co., Hartford 6, Conn.
Sturtevant Div., Westinghouse Elec Corp., Boston 16, Mass.
Von Schraeder Mfg. Co., Racine, Wis.

COMPRESSORS, AIR

*American Chain & Cable Co., Detroit 2, Mich.
Baker-Air Equipment Co., Alameda, Calif.
Bean Mfg. Co., John, Lansing, Mich.
Binks Mfg. Co., 3124 Carroll Ave., Chicago, Ill.
*Brunner Mfg. Co., Utica 1, N. Y.
Champion Pneumatic Machy. Co., Princeton, Ill.
Chicago Pneumatic Tool Co., 6 East 44th St., New York, N. Y.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
*De Vilbiss Co., Toledo 1, Ohio
Hardie Mfg. Co., Hudson, Mich.
Imperial-Cantrell Mfg. Co., Jellico, Tenn.
*Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Kellogg Div. American Brake Shoe & Fdy. Co., Rochester, N. Y.
Quincy Compressor Co., Quincy, Ill.
U. S. Air Compressor Co., Cleveland 5, Ohio

Note—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Wayne Pump Co., Salisbury, Md.
*Weaver Mfg. Co., Springfield, Ill.
*Westinghouse Air Brake Co., Wilmerding, Pa.
Worthington Pump & Machy. Corp., Harrison, N. J.

CRANES and CHAIN HOISTS

Canton Div., Hill Acme Co., Cleveland, Ohio
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
David Round & Son, Cleveland 22, Ohio
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Electro Lift, Inc., 30 Church St., New York 7, N. Y.
Kent-Moore Organization, Detroit, Mich.
Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y.
Silent Hoist & Crane Co., Brooklyn 20, N. Y.
*Weaver Mfg. Co., Springfield, Ill.
Wright Mfg. Div., American Chain & Cable Co., York, Pa.
Yale & Towne Mfg. Co., Philadelphia 24, Pa.

DOORS, GARAGE and SHOP (Automatic Opening Equipment)

Barber-Coleman Co., Rockford, Ill.
*Kinnear Mfg. Co., Columbus 16, Ohio.
Overhead Door Co., Cortland, N. Y.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Truscon Steel Co., Youngstown 1, Ohio

DRILLS, ELECTRIC

*Albertson & Co., Sioux City, Iowa
Black & Decker Mfg. Co., Towson, Md.
Cummins Portable Tools, 4740 N. Ravenswood Ave., Chicago 40, Ill.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6, Ill.
*Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Mall Tool Co., 7737 S. Chicago Ave., Chicago 19, Ill.
Millers Falls Co., Greenfield, Mass.
Skil Corp., 5031 Elston Ave., Chicago 30, Ill.
*Snap-On Tools Corp., Kenosha, Wis.
Stanley Tools, New Britain, Conn.
Thor Corp., Aurora, Ill.
U. S. Electrical Tool Co., Cincinnati, Ohio
Van Dorn Elec. Tool Co., Towson, Md.

DYNAMOMETERS, ENGINE TESTING

Chatillon & Sons, John, 85 Cliff St., New York 7, N. Y.
Clayton Mfg. Co., 1362 Ellis Lane, El Monte, Calif.
Taylor Dynamometer Co., Milwaukee, Wis.
Toledo Scale Co., Telegraph Rd., Toledo 12, Ohio

FANS and BLOWERS, VENTILATING and EXHAUST

Buffalo Forge Co., Buffalo, N. Y.
*De Vilbiss Co., Toledo 1, Ohio
Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.
Sturtevant Div., Westinghouse Elec. Corp., Boston 36, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FIXTURES, ALIGNING (Piston Pin, Rod)

Automotive Maintenance Mchy Co., 2100 Commonwealth Ave., Chicago, Ill.
Storm Mfg. Co., Minneapolis, Minn.
Sunnen Products Co., St. Louis, Mo.
Taft-Pierce Mfg. Co., Woonsocket, R. I.

FLUSHERS, RADIATOR CLEANING

Choldum Mfg. Co., New Haven, Conn.
Hoyt-Beardsley Mfg. Co., Sioux City, Iowa
Trowbridge Auto Radiator Co., Cambridge, N. J.

GAGES, TIRE

Acme Air Appliance Co., Brooklyn, N. Y.
Barmotive Products, Inc., San Leandro, Calif.
Brunner Mfg. Co., Utica 1, N. Y.
Dill Mfg. Co., Cleveland 3, Ohio
Druge Bros. Mfg. Co., Oakland, Calif.
*Schrader's Son, A., Div. Scovill Mfg. Co., Brooklyn, N. Y.
Service Equipment Co., South Gate, Calif.
Service Station Eqpt. Co., Muskegon, Mich.
Stewart-Warner Corp., Chicago, Ill.
U. S. Gage Co., 14 Wall St., New York 5, N. Y.

GAGES, WHEEL ALIGNING

Bear Mfg. Co., Rock Island, Ill.
Bee Line Co., Davenport, Iowa
Bennett Feragen, Inc., South Bend, Ind.
Duby Co., John F., Dorchester, Mass.

Sturdy metal carrying case holds MOTORITE and as many as five MOTORITE Adapters.

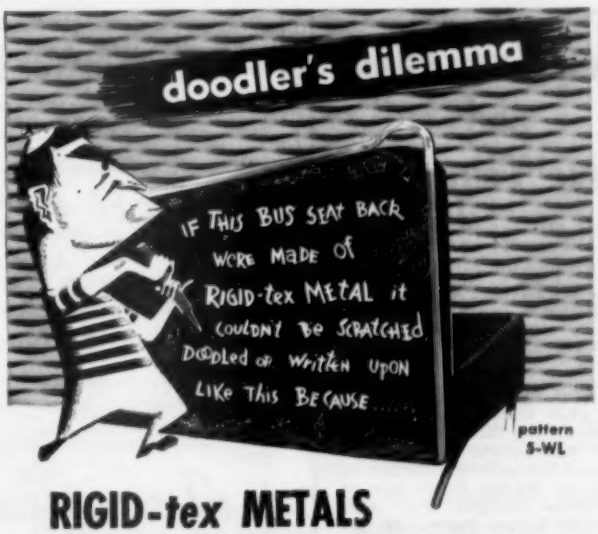
TESTS ALL THESE ENGINES

Allis-Chalmers	Lathrop
Buda	Leyland
Caterpillar	Lorimer
Cletrac	Mack
Climax	Massey-Harris
Continental	Murphy
Cummins	Oliver
General Motors	Packard
Gray Marine	Palmer
Hallett	Red Wing
Harnischfeger	Shepherd
Hercules	Superior
Hill	U.S. Motors
International	Waukesha
John Deere	Waukesha-Hesselman
Kermath	

The MOTORITE is an indispensable service tool for maintenance and repair of busses, trucks, contractor's machinery, drilling rigs and other mobile Diesel power plants.

Write for Bulletin 643 which gives complete particulars.

BACHARACH INDUSTRIAL INSTRUMENT CO.
7301 Penn Avenue • Pittsburgh 8, Pa.


doodler's dilemma
IF THIS BUS SEAT BACK WERE MADE OF RIGID-tex METAL it COULDN'T BE SCRATCHED DOODLED ON WRITTEN UPON LIKE THIS BECAUSE.....

pattern S-WL

RIGID-tex METALS

have a clear-through pattern that conceals damage and keeps transit buses out of the repair shops . . . saves maintenance costs up to 60%. what's more, Rigid-tex Metals seat backs stay looking like new and require no painting. over 200,000 now in use.

Send for 16-page complete catalog . . . on company letterheads please, or see Sweets Catalog 1a/Ri.

See us at the Cooking & Heating Appliance Manufacturers Show, June 7-9, Booth 70, Washington, D. C.

RIGID-tex METALS
RIGIDIZED METALS CORPORATION
6726 OHIO STREET BUFFALO 3, N. Y.

60 Warehouses and Sales Representatives in All Principal Cities Throughout the U. S. and Canada

U. S. & Foreign Patents

Hunter Engrg. Co., St. Louis, Mo.
Lee Co., K. O., Aberdeen, S. D.
Manbee Equipment Co., 185 N. Wabash, Chicago, Ill.
Manley Mfg. Co., Div. American Chain Co., York, Pa.
Motor Wheel Corp., Lansing, Mich.
*Snap-On Tools Corp., Kenosha, Wis.
Speedmaster Co., Des Plaines, Ill.
Testing Apparatus, Inc., Detroit, Mich.
*Weaver Mfg. Co., Springfield, Ill.

GAGES and MICROMETERS

Ames Co., B. C., Waltham, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Central Tool Co., Cranston, R. I.
Federal Products Corp., Providence, R. I.
Millers Falls Co., Greenfield, Mass.
Plomb Tool Co., Los Angeles 54, Calif.
Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.
Slocomb Co., J. T., Providence, R. I.
*Snap-On Tools Corp., Kenosha, Wis.
Starrett Co., L. S., Athol, Mass.

GRINDERS, BENCH and PEDESTAL

*Albertson & Co., Sioux City, Iowa
American Hydraulics, Inc., Sheboygan, Wis.
Baldor Electric Co., St. Louis 10, Mo.
Black & Decker Mfg. Co., Townson, Md.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Cincinnati Electrical Tool Co., Cincinnati, Ohio
Lee Co., K. O., Aberdeen, S. D.
Lempco Products, Inc., Bedford, Ohio
Millers Falls Co., Greenfield, Mass.
Simplicity Mfg. Co., Port Washington, Wis.
Skil Corp., 5031 Elston Ave., Chicago 30, Ill.
*Snap-On Tools Corp., Kenosha, Wis.
Stanley Tools, New Britain, Conn.
Sunnen Products Co., St. Louis, Mo.
U. S. Electrical Tool Co., Cincinnati, Ohio
Van Dorn Elec. Tool Co., Towson, Md.
*Van Norman Co., Springfield 7, Mass.
Weidenhoff, Inc., Joseph, Ft. Wayne, Ind.

GRINDERS, CRANKSHAFT

Heald Machine Co., Worcester, Mass.
Landis Tool Co., Waynesboro, Pr.
Norton Co., Worcester 6, Mass.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GRINDERS and HONES, CYLINDER RECONDITIONING

*Albertson & Co., Sioux City, Iowa
American Engr. Co., Philadelphia, Pa.
Automotive Maintenance Mchy. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Landis Tool Co., Waynesboro, Pa.
Lempco Products, Inc., Bedford, Ohio
Rottler Boring Bar Co., Seattle, Wash.
Simplicity Mfg. Co., Port Washington, Wis.
Storm Mfg. Co., Minneapolis, Minn.
Sunnen Products Co., St. Louis, Mo.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GRINDERS, PISTON

Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Rottler Boring Bar Co., Seattle, Wash.
Storm Mfg. Co., Minneapolis, Minn.
*Van Norman Co., Springfield, Mass.

GRINDERS, VALVE (Refacing and Seating)

*Albertson & Co., Sioux City, Iowa
Black & Decker Mfg. Co., Townson, Md.
Cedar Rapids Engrg. Co., Cedar Rapids, Iowa
Evans Reamer & Mach. Co., 4541 N. Ravenswood Ave., Chicago, Ill.
Kent-Moore Organization, Detroit, Mich.
Landis Tool Co., Waynesboro, Pa.
Lee Co., K. O., Aberdeen, S. D.

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

Lisle Corp., Clarinda, Iowa
Simplicity Mfg. Co., Port Washington, Wis.
*Snap-On Tools Corp., Kenosha, Wis.
Sunnen Products Co., St. Louis, Mo.
Van Dorn Electric Tool Co., Towson, Md.
*Van Norman Co., Springfield, Mass.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

GUNS, PAINT SPRAY—See Sprayers, Paint

GUNS, SAND BLAST

Roesch & Co., C. A., Los Angeles, Calif.
Vacu-Blast Co., Inc., Belmont, Calif.

GUNS, TANKS and LUBRICATORS, GREASING

Aro Equipment Corp., Bryan, Ohio
Baicrank, Inc., Cincinnati, Ohio
Brown-Dynalube Co., Charlotte, N. C.
Gray Co., Minneapolis, Minn.
Hollingshead Corp., R. M., Camden, N. J.
Lubrication Machy. Corp. of America, Newark, N. J.
Lincoln Engrg. Co., St. Louis, Mo.
Smith-Johnson Co., Los Angeles 21, Calif.
Stewart-Warner Co., 1828 W. Diversey Pkwy., Chicago 14, Ill.
*Weaver Mfg. Co., Springfield, Ill.

HEATERS, GARAGE UNIT

R. D. Fageol Co., Detroit 11, Mich.
Grinnell Co., Providence 1, R. I.
Modine Mfg. Co., Racine, Wis.
Sturtevant Div., Westinghouse Elec Corp., Boston 36, Mass.
Unit Heater & Cooler Co., Wausau, Wis.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, HOT SPRAY—See Sprayers, Hot Paint

HOISTS—See Cranes and Hoists—also Lifts

HORSES, ADJUSTABLE STEEL

Bassick Co., Bridgeport, Conn.
Kent-Moore Organization, Detroit, Mich.
Manley Mfg., Div., American Chain Co., York, Pa.

Speed Your Filling and Save Your Fuel

Filling and venting systems of fuel tanks should be designed...

(a) To provide for fast pumping speeds without blowback.

(b) To eliminate spillage due to overfilling.

(c) To provide an expansion zone *within the tank.*

You gain these filling advantages when the tank is equipped with a VENTALARM Signal. You also avoid the extreme hazard of spillage on garage floors due to temperature changes. For with VENTALARM Signal, there is no excuse for filling up into the filler neck.

On all new equipment, specify

VENTALARM®
WHISTLING TANK FILL SIGNAL
"Just fill 'til the whistle stops."
SCULLY SIGNAL COMPANY
174 Green St., Melrose 76, Mass.

RADIATOR REPAIRMEN!
For easier, faster, more efficient service, use —
Write for free Supply Catalog!
LAKE RADIATOR SHOP TOOLS & SUPPLIES
...AND FOR YOUR PROTECTION—
Recommend genuine Lake replacement Cores. THEY'RE GUARANTEED! The finest cores made for cars, trucks, busses, tractors and industrial equipment.
Our latest Core Catalog includes 1952, 1953 and 1954 models.
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5005 Euclid Avenue • Cleveland 3, Ohio
Branch — 2115 E. 25th St. • Los Angeles 58, Calif.

Announcing

NEW LINE OF DIESEL SERVICE TOOLS
COMPLETE line of service tools for GMC Diesel Engines and Hydraulic Transmissions. Write today for catalog.
EBCOR TOOLS
TRADEMARK
Ebersol Machine & Tool Corp. POTTSTOWN, PENNA. PHONE 3663

Walker Mfg. Co., Racine, Wis.

INSTRUMENTS, DIESEL TESTING — See Testers, Diesel

INSTRUMENTS, ELECTRICAL TESTING

Allen Electric & Equip. Co., Kalamazoo, Mich.
*Electric Auto-Lite Co., Auto Wire & Cable Div., Toledo, Ohio
General Electric Co., Schenectady 5, N. Y.
Ideal Industries, Inc., Sycamore, Ill.
King Elec. Co., Cleveland, Ohio
Lanagan & Hoke, Philadelphia, Pa.
Sun Elec. Mfg. Co., Chicago, Ill.
Weidenhoff, Inc., Joseph, Ft. Wayne, Ind.
*Westinghouse Elec. Corp., Pittsburgh, Pa.

JACKS, FLOOR and HAND

Airquipment Co., Burbank, Cal.
Auto Specialties Mfg. Co., St. Joseph, Mich.
Ajax Auto Parts Co., Racine, Wis.
*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Bay Mfg. Co., P.O. Box 578, Torrance, Calif.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Buda Co., Harvey, Ill.
Chatsworth Mfg. Co., Chatsworth, Ga.
Cleveland Pneumatic Tool Co., Cleveland 5, Ohio
Coffing Hoist Co., Danville, Ill.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hein-Werner Motor Parts Corp., Waukesha, Wis.
Homestead Valve Co., Coraopolis, Pa.
Joyce-Cridland Co., Dayton, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
Menasco Mfg. Co., Burbank, Cal.
National Standard Co., Niles, Mich.
Reliable Jack Div., Dayton Malleable Iron Co., Dayton 1, Ohio
Templeton, Kenly & Co., 1020 S. Central Ave., Chicago 44, Ill.
Walker Mfg. Co., Racine, Wis.
*Weaver Mfg. Co., Springfield, Ill.

LATHES

Axelson Mfg. Co., Los Angeles 11, Calif.
Barnes Co., W. F. & John, Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Hendly Machine Co., Torrington, Conn.
LeBlond Machine Tool Co., R. K. Cincinnati, Ohio
Rockford Machine Tool Co., Rockford, Ill.
Sheldon Machine Co., 4229 N. Knox Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

LATHES and GRINDERS, BRAKE DRUM

U. S. Electrical Tool Co., Cincinnati, Ohio
Bean Mfg. Co., John, Lansing, Mich.
Chicago Rivet & Machine Co., Bellwood
Barrett Equipment Co., St. Louis, Mo.
Van Dorn Elec. Tool Co., Towson, Md.
Ill.
Strand & Co., N. A., 5001 N. Wolcott, Chicago, Ill.
Lempco Products, Inc., Bedford, Ohio.
South Bend Lathe Wks., South Bend, Ind.
*Van Norman Co., Springfield, Mass.
*Wadell Equipment Co., Garwood, N. J.
Waterbury Tool Div., Vickers, Inc., Waterbury, Conn.

LIFTS or HOISTS, BUS

Curtis Pneumatic Mchy., Div., Curtis Mfg Co., St. Louis 20, Mo.
Globe Hoist Co., Philadelphia 18, Pa.
Joyce-Cridland Co., Dayton 3, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
Rotary Lift Co., Memphis, Tenn.
Walker Mfg. Co., Racine, Wis.
*Weaver Mfg. Co., Springfield, Mass.
*Whiting Corp., Harvey, Ill.

LOCKERS—See Shelving, Parts Bins, Etc.

MACHINES, SANDING and POLISHING

*Albertson & Co., Sioux City, Iowa
Black & Decker Mfg. Co., Towson, Md.
Carborundum Co., Niagara Falls, N. Y.
Detroit Surfacing Mach. Co., Detroit 4 Mich.
Haskins Co., R. G., 2750 W. Flournoy St. Chicago 12, Ill.
Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill.
Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.
*Snap-On Tools Corp., Kenosha, Wis.
Skil Corp., 5031 Elston Ave., Chicago 30, Ill.

MACHINES, WHEEL ALIGNING — See GAGES, WHEEL ALIGNING

MACHINES, WHEEL BALANCING

Bean Mfg. Co., John, 1305 S. Cedar St., Lansing, Mich.
Bear Mfg. Co., 21st St. & Fifth Ave., Rock Island, Ill.
Bee-Line Co., Box 569, Davenport, Iowa
Bennett-Feragen, South Bend, Ind.
Bull's Eye Wheel Balancing Co., 233 Mayo Bldg., Tulsa, Okla.
Hunter Engrg. Co., St. Louis, Mo.
Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.
*Weaver Mfg. Co., 2177 S. Ninth St., Springfield, Ill.

MICROMETERS—See Gages and Micrometers

PARTS-WASHING, EQUIPMENT for

Aeroil Prod. Co., South Hackensack, N. J.
Blakeslee & Co., G. S., 1844 S. 52nd St., Chicago 50, Ill.
Clayton Mfg. Co., (Kerrick), Alhambra, Calif.
Detrex Corp., Detroit, Mich.
Grinnell Co., Providence 1, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Gray-Mills Co., Evanston, Ill.
Hydra Lectric Prod. Co., Indianapolis, Ind.
Livingstone Engr. Co., 100 Grove St., Worcester, Mass.
*Magnus Chemical Co., Garwood, N. J.
*Oakite Products, Inc., 22E Thames St., New York 6, N. Y.
Practical Products Co., Minneapolis 8, Minn.
Roth Mfg. Co., 1600 S. Kilbourn Ave., Chicago, Ill.
Siebring Mfg. Co., George, Iowa
Tivit Products Co., Torrance, Calif.
Whiting Corp., Harvey, Ill.

PRESSES, ARBOR

A. B. C. Products, Los Angeles, Calif.
Greenerd Arbor Press Co., Nashua, N. H.
Lempco Products, Inc., Bedford, Ohio
Manley Mfg. Div., American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Ill.

PULLERS, WHEEL and GEAR

*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Bear Mfg. Co., Rock Island, Ill.
Cole-Hersee Co., Boston, Mass.
Crane Puller Co., Waltham, Mass.
Greb Co., Stoughton, Mass.
Manley Mfg. Div., American Chain Co., York, Pa.
National Machine & Tool Co., 4077 Page St., Jackson, Mich.
*Snap-On Tools Corp., Kenosha, Wis.
Sweeney Mfg. Co., B. K., Denver, Colo.
U. S. Axle Co., Pottstown, Pa.

PUMPS and TANKS, GAS and OIL, STORAGE and DISPENSING

Acme Pump & Tank Corp., 521 Fifth Ave., New York 17, N. Y.
Aqua Systems, Inc., 385 Gerard Ave., New York 51, N. Y.
*Bowser, Inc., Fort Wayne 2, Ind.
Erie Meter Systems, Inc., Erie, Pa.
Gilbert & Barker Mfg. Co., Springfield, Mass.
Liquidometer Corp., Long Island City, N. Y.
Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.
Service Station Equipment Co., Muskegon, Mich.
Sharpsville Steel Fabricators, Inc., Sharpsville, Pa.
Tokheim Oil Tank & Pump Co., Fort Wayne, Ind.
Wayne Pump Co., Salisbury, Md.
Yale & Towne Mfg. Co., Stamford, Conn.

REAMERS—See Taps, Dies, Reamers, Etc.

RECLAIMERS and RECTIFIERS, OIL

Hilliard Corp., Elmira, N. Y.
Luber-Finer, Inc., Los Angeles 7, Calif.
Oil Purifier, Inc., Oakland, Calif.
Skinner Purifiers, Inc., Detroit, Mich.
Youngstown Miller Co., Bellville, N. J.

RECTIFIERS, BATTERY CHARGING — See Charges, Battery

NOTE—*More complete descriptions of this manufacturer's products appear in advertising pages of this or previous issues during the past year.

NOW Every Bus-Fleet Company Can

★ Up Operating Revenue
★ Boost Patronage & Profits
★ Increase Equipment Life

with

JETOMATIC's NEW Overhead Washers

the greatest advancement in automotive washing!

Cleanliness Pays Off handsomely in Money-, Time-, Labor-, and Space-savings . . . Clean bodies and parts last longer. Jeto-propel your profits with Jetomatic Automatic, Guaranteed-Performance Washers!

★ No engineering needed
★ No compressor needed
★ No special bay needed

Portable . . . Simple to install and use.
Fast . . . economical to buy and operate.
Compact . . . rolls against wall when not in use.
Efficient . . . jet spray quickly removes dirt and washes *clean!* Keeps buses on schedule.

• Write for new catalog. *• Distributor Inquiries Invited.*

JETOMATIC, Inc.

Wakelee at Halibut **Ansonia, Conn.**

RECTIFIERS, OIL—See Reclaimers and Rectifiers, Oil

REGROOVERS, TIRE

*Bendix Products, Div. Bendix Aviation Corp., South Bend, Ind.
Kent-Moore Organization, Detroit, Mich.
Shaler Co., Waupun, Wis.
Stackhouse, E. H., Philadelphia, Pa.
Vanderbilt-Osborne Corp., Newark, N. J.

SANDERS—See Machines, Sanding and Polishing

SHAFTING, FLEXIBLE

Strand & Co., N. A., 5001 N. Wolcott St., Chicago 40, Ill.

SHELVING, PARTS BINS, TOOL STANDS, BENCHES, LOCKERS, ETC.

Ainsworth Mfg. Corp., Detroit 7, Mich.
American Locker Co., Boston, Mass.
Aurora Steel Products Co., Aurora, Ill.
Darby & Son, E. J., Philadelphia, Pa.
*Electric Service Mfg. Co., Philadelphia 32, Pa.
Hall Co., Gordon L., Old Lynne, Conn.
Lyon Metal Products, Inc., Aurora, Ill.
National Scale Co., Chicopee Falls, Mass.
Penn Metal Corp., Philadelphia, Pa.
*Snap-On Tools Corp., Kenosha, Wis.
Standard Pressed Steel Co., Jenkintown, Pa.
Stackbin Corp., Olneyville, R. I.
Superior Mfg. Co., Winston-Salem, N. C.

SPRAYERS, METAL COATING

Bede Industrial Products Inc., Cleveland Ohio
Metals Coating of America, Philadelphia, Pa.
*Metallizing Engineering Co., Long Island City, N. Y.
Metallizing Co. of America, 1320 W. Congress St., Chicago, Ill.

SPRAYERS, PAINT

Binks Mfg. Co., 3124 W. Carroll Ave., Chicago, Ill.
Black Mfg. Co., Baltimore, Md.
Brunner Mfg. Co., Utica 1, N. Y.
Crown Spray Gun Mfg. Co., Los Angeles, Calif.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
Decora Mfg. Co., Berkeley, Calif.
*DeVilbiss Co., Toledo 1, Ohio
Eclipse Air Brush Co., Newark, N. J.
Electric Sprayit Co., Sheboygan, Wis.
Kellogg Div., American Brake Shoe & Fdry. Co., Rochester, N. Y.
Master Mfg. Co., 811 W. Cabrini St., Chicago 7, Ill.
Metal Specialties Mfg. Co., 3200 W. Carroll Ave., Chicago, Ill.
Paasche Airbrush Co., 1909 W. Diversey Pkwy., Chicago 14, Ill.
Spray Engineering Co., Somerville, Mass.

SPRAYERS, HOT PAINT

Spee-Flo Co., The, 3603 Harrisburg Blvd., Houston, Texas

STANDS, AXLE REPAIR

*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Continental Sales Corp., Columbus, Ind.
Kent-Moore Organization, Detroit, Mich.
Manley Mfg., Div. American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Ill.

STANDS, JIGS and FIXTURES, ENGINE REPAIR

*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Clayborne Mfg. Co., 4541 W. Lake St., Chicago, Ill.
Continental Mfg. Co., Columbus, Ind.
*Ebersol Mach. & Tool Corp., Pottstown, Pa.
Kent-Moore Organization, Detroit, Mich.
Latch Engrg. Co., Chester, Pa.
Manley Mfg., Div. American Chain Co., York, Pa.
*Weaver Mfg. Co., Springfield, Ill.

STANDS, TOOL—See Shelving, Parts Bins

STANDS, TRANSMISSION and DIFFERENTIAL, REPAIR

*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Bennett, Feragen, Inc., South Bend, Ind.
*Ebersol Mach. & Tool Corp., Pottstown, Pa.
Kent-Moore Organization, Detroit, Mich.
Manley Mfg., Div. American Chain Co., York, Pa.

TANKS, GREASING—See Guns and Tanks Greasing

TANKS, OIL and GREASE—See Pumps and Tanks, Oil and Grease

TAPS, DIES, REAMERS, Etc.

Alvord-Polk Tool Co., Millersburg, Pa.
Automotive Maint. Mach. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
C. & W. Tool Co., Cambridge, Mass.
Cleveland Twist Drill Co., Cleveland, Ohio
Foster-Johnson Reamer Co., Elkhart, Ind.
Greenfield Tap & Die Corp., Greenfield, Mass.
Keystone Reamer & Tool Co., Millersburg, Pa.
Morse Twist Drill & Mach. Co., New Bedford, Mass.
Reiff & Nestor Co., Lykens, Pa.
Ridge Tool Co., Elyria, Ohio
*Snap-On Tools Corp., Kenosha, Wis.
Watervliet Tool Co., Albany, N. Y.
Wayne Tool Co., Waynesboro, Pa

TESTERS, BRAKE

Bean Mfg. Co., John, Lansing, Mich.
Bear Mfg. Co., Rock Island, Ill.
Bennett-Feragen, Inc., South Bend, Ind.
Brakemaster Corp., Chicago 50, Ill.
Muther Mfg. Co., Boston, Mass.
*Weaver Mfg. Co., Springfield, Ill.

TESTERS & TOOLS, DIESEL FUEL SYSTEMS

*Bacharach Industrial Instrument Co., Pittsburgh 8, Pa.
Buda Co., Harvey, Ill.
*Ebersol Mach. & Tool Corp., Pottstown, Pa.
Hein-Werner Motor Parts Corp., Waukesha, Wis.
Kent Moore Org., Detroit, Mich.

TESTERS, DIESEL—Compression, Smoke, Fuel Pump, Nozzles — See Testers, Diesel Fuel Systems

TESTERS, EXHAUST GAS—See Analyzers, Exhaust Gas

PROTECT REVENUE WITH Allocated* METAL FARE TOKENS

Ideal for multi-fare and fractional fare systems. Attract riders. Speed fare handling. Eliminate change-making delays. Assure accurate sorting, counting and wrapping by maintenance of identical size. An investment . . . not an expense, for they wear indefinitely.

* Allocated . . . an exclusive M & W method of manufacturing metal fare tokens individually designed for each customer. Perforations and lettering are in the same relative aligned position on every token which makes them identical, thus protecting against duplication. This is especially important with no Federal law protection.

MEYER & WENTHE Incorporated

Established 1854

TRANSPORTATION DIVISION

30 South Jefferson Street, Chicago 6, Illinois

TOOLS, BEARING

Automotive Maintenance Mchy. Co., 2100 Commonwealth Ave., N. Chicago, Ill.
Freeport Machine Wks., Freeport, Ill.
Kent-Moore Organization, Detroit, Mich.
Landis Tool, Inc., Waynesboro, Pa.
Lempco Products, Inc., Bedford, Ohio
Taft-Pierce Mfg. Co., Woonsocket, R. I.
Tobin-Arp Mfg. Co., Minneapolis 15, Minn.

TOOLS, HAND and SPECIAL PURPOSE

*Albertson & Co., Sioux City, Iowa
*Bacharach Indust'l Inst. Co., Pittsburgh 8, Pa.
Black & Decker Mfg. Co., Towson, Md.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Eclipse Air Brush Co., Newark, N. J.
*Ebersol Mach. & Tool Corp., Pottstown, Pa.
Everhot Mfg. Co., Maywood, Ill.
Fairmount Tool & Forging Co., Cleveland, Ohio
Fostoria Pressed Steel Corp., Fostoria, Ohio
Herbrand Corp., Fremont, Ohio
*Ingersoll Rand Co., 11 Broadway, New York, N. Y.
Ken-Tool Mfg. Co., Akron, Ohio
K-D Mfg. Co., Lancaster, Pa.
Lee Co., K. O., Aberdeen, S. D.
New Britain Mach. Co., New Britain, Conn.
Peck, Stow & Wilcox Co., Southington, Conn.
Porter, Inc., H. K. Everett 4w, Mass.
Proto Tools, Los Angeles 54, Calif.
Rinck & McIlwaine, Inc., 16 Hudson St., New York, N. Y.
*Snap-On Tools Corp., Kenosha, Wis.
Stanley Tools, New Britain, Conn.
Swallow Airplane Co., Wichita, Kan.
Van Dorn Electric Tool Co., Towson, Md.
*Weaver Mfg. Co., Springfield, Ill.
Williams Co., J. H., Buffalo 7, N. Y.

TOOLS, PNEUMATIC

Chicago Pneumatic Tool Co., E. 44th St., New York 17, N. Y.
Cummins Portable Tools, 4740 N. Ravenswood Ave., Chicago 40, Ill.
Independent Pneumatic Tool Co., 260 S. Jefferson St., Chicago 6, Ill.

BUS AGENTS
U.S.A.—CANADA—ALASKA
MEXICO
SCHEDULE INFORMATION
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$10.00 per year, 12 issues—
Published by
RUSSELL'S GUIDES, INC.
Cedar Rapids, Iowa

STOLEN FARES?

By operators "knocking down" or by passengers "stealing rides." Practical Perey Turnstile Systems efficiently get more fares.

Install PEREY TURNSTILES
106 EAST 41st ST., NEW YORK 17, N. Y.

STOP that WATER

With FORMULA NO. 640, a clear liquid which penetrates 1", plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. $3 in 55's. Free sample. See Sweet's. Haynes Products Co., Omaha 3, Nebr.

*Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Keller Tool Co., Grand Haven, Mich.
Skil Corp., 5033 Elston Ave., Chicago 30, Ill.
U. S. Tool Co., Ampere, N. J.

VISES

*American Chain & Cable Co., Bridgeport, Conn.
Columbian Vise & Mfg. Co., Cleveland, Ohio
Millers Falls Co., Greenfield, Mass.
Parker Co., Chas., Meriden, Conn.
Rock Island Div., Birtman Elec Co., Rock Island, Ill.
Stanley Tools, New Britain, Conn.

WASHERS, BUS

*American Chain & Cable Co., Bridgeport, Conn.
Bean Mfg. Co., John, Lansing, Mich.
Beaurline Fountain Brush Co., 1243 S. Wabash Ave., Chicago, Ill.
Brunner Mfg. Co., Utica 1, N. Y.
Choldun Mfg. Co., New Haven, Conn.
Clayton Mfg. Co., Alhambra, Calif.
Curtis Pneumatic Mchy., Div. Curtis Mfg. Co., St. Louis 20, Mo.
Goulds Washing Systems, Inc., 20 N. Wacker Dr., Chicago, Ill.
Hardie Mfg. Co., Hudson, Mich.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jetomatic Corp., Ansonia, Conn.
Leeds, Tozzer & Co., 92 Liberty St., New York, N. Y.
Myers & Bro. Co., F. E., Ashland, Ohio
*Ross & White Co., 400 W. Madison St., Chicago 6, Ill.
Washmobile Corp., 350 N. Foothill Rd., Beverly Hills, Los Angeles, Calif.
*Weaver Mfg. Co., Springfield, Ill.
Whiting Corp., Harvey, Ill.
Wolfe Brush Co., Pittsburgh, Pa.

WELDING and HARD FINISHING PROCESSES (Contract)

*Automotive Generator Service, St. Louis, Mo.
Brodie System (B&J), Brooklyn, N. Y.
Kerkling & Co., Bloomington, Ind.
Moguloid Co. of Amer., 1503 W. Van Buren St., Chicago 7, Ill.
Searles Electric Welding Wks., 1320 S. 47th St., Chicago, Ill.
Stark, Inc., Ralph, Long Island City, N. Y.

WELDERS, ELECTRIC and GAS

Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.
Allen Elec. & Eqpt. Co., Kalamazoo, Mich.
Eutectic Welding Alloys Corp., Flushing 58, N. Y.
General Electric Co., Schenectady 5, N. Y.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland 1, Ohio
Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.
Marquette Mfg. Co., Minneapolis, Minn.
Milburn Co., Alex., Baltimore, Md.
National Welding Eqpt. Co., San Francisco, Calif.
Peterson Welding Co., Kansas City, Mo.
Smith Welding Equipment Corp., Minneapolis, Minn.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Victor Eqipt. Co., San Francisco, Calif

WHEELS, GRINDING

American Emery Wheel Works, Providence, R. I.
Carborundum Co., Niagara Falls, N. Y.
Norton Co., Worcester 6, Mass.
*Snap-On Tools Corp., Kenosha, Wis.
*Van Norman Co., Springfield, Mass.

WRENCHES, END and SOCKET

Armstrong Bros. Tool Co., 317 N. Francisco Ave., Chicago 12, Ill.
Apco-Mossberg Co., Attleboro, Mass.
Billings & Spencer Co., Hartford 6, Conn.
*Blackhawk Mfg. Co., Milwaukee 1, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
*Ebersole Mach. & Tool Corp., Pottstown, Pa.
Herbrand Corp., Fremont, Ohio
New Britain Machine Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Petersen Mfg. Co., De Witt, Neb.
Plomb Tool Co., Los Angeles 54, Calif.
*Snap-On Tools Corp., Kenosha, Wis.
Stevens Walden, Inc., Worcester, Mass.
Vichek Tool Co., Cleveland, Ohio
Williams & Co., J. H., Buffalo 7, N. Y.

New Regenerative Gas Turbine...

. . . capable of operating a current model automobile in city or highway traffic has been developed by Chrysler Corporation. The engine is now undergoing road tests in a standard Plymouth at the company's proving grounds. According to Chrysler, the gas turbine's fuel economy equals that of conventional automobile engines, its exhaust is cooler than that discharged by the average car, and its performance is far beyond that of piston engines of comparable horsepower.

Key to the turbine engine's fuel economy and cool exhaust, is said to be a revolutionary new heat exchanger or regenerator, which utilizes most of the heat discharged as waste by conventional gas turbines. This heat is transferred to the incoming flow of fresh air and becomes available as useful energy to drive the wheels of the car.

Development of the Chrysler regenerative gas turbine does not mean that such an engine is ready for general use. "Whether we ultimately shall see commercial production of gas turbines for passenger cars, depends on the long-range solution of many complex metallurgical manufacturing problems and there is no telling at this time how long it will take to solve these problems," says Chrysler. The limited supply of such strategic materials currently prohibits the use of gas turbines in automobiles except on an experimental basis, until materials supply eases up.

The gas turbine is almost 200 lb lighter, and has less than a fifth as many major moving parts as a piston engine of similar power. Fitting easily into the engine compartment of the Plymouth test car, the turbine unit together with its set of reduction gears is 32 inches long x 33 inches wide x 28 inches high. The torque available for acceleration from any given speed within the range of the turbine-powered car is much greater than that produced by piston engines and transmissions.

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(Classified Advertising)
H. E. Hilty, Mgr.

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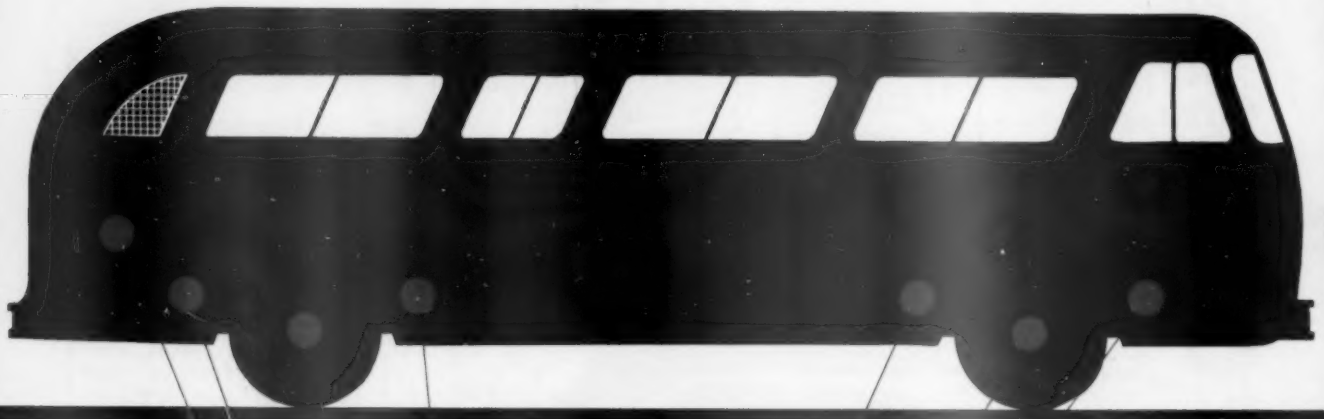

NEW STANDARD LITHIUM MULTI-PURPOSE GREASE

● Here is a true multi-purpose grease that can be *used practically anywhere* on the job or in the shop. With new STANDARD Lithium Multi-Purpose Grease you can effectively lubricate all normally encountered grease-lubricated bearings with just one grease! No need for keeping old-fashioned special-grease inventories with complex dispensing equipment . . . no chance of costly application mistakes.

New STANDARD Lithium Multi-Purpose Grease is water and high-temperature resistant and can be used in mechanically and hand-operated dispensers and in grease cups. It replaces such greases as viscous lubricants, water pump grease, wheel-bearing grease, cup and fiber greases and can be used for general chassis and lubrication of a wide variety of bearings—ball, roller, plain, needle—under wet and hot operating conditions. Meets rigid requirements of wheel bearing manufacturers.

Now you can reduce grease inventories, eliminate waste, do away with costly application errors with STANDARD Lithium Multi-Purpose Grease. Ideal for fleet operators, contractors, other large-scale users of heavy automotive equipment. Call your nearby Standard Oil lubrication specialist now.

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